ComputerWeekly

Thursday, August 26, 1982

At least 500 jobs to go at Swansea centre

by Kevan Pearson

THE £15 million plan to replace the Driver and Vehicle Licensing Centre's computers will put 500 people out of work at the Swansea centre, according to DVLC management estimates.

The jobs will go by natural wastage rather than by compulsory redundancies, according to chiefs at the centre; and all the jobs will not go until the system is fully operational.

This could mean that most of the 500 are safe for a few years. However, union officials at the DVLC think that management estimates are conservative, and that more jobs could go.

The figure was revealed in Parliament by Under Secretary for Transport Linda Chalker, in reply to a question from Labour MP for Swansea East Donald Anderson.

The DVLC employs about 4,200 people at the moment, most of them in clerical jobs. The Civil and Public Servants' Association, to which most of the clerical grades belong, estimates that there are almost 3,500 clerical jobs at the centre.

A further reduction of 500 will bring the number of people employed at Swansea to less than half the total number of 7,960 employed there in 1978.

Diane Warwick, the CPSA's Department of the Environment secretary, described the job cuts as "appalling" in an area like Swansea, where unemployment is already well above the national level following the cutbacks in the steel industry.

The problem the union faces is that no jobs will actually be axed. The cuts will be made by not replacing people who leave or who are promoted. Warwick says it is very difficult to fight job cuts where individuals are not directly threatened.

The DVLC replacement contract is worth over £15 million for the hardware alone, which will comprise mainframe computers and online, disc-based storage to replace the present tape-based system. The software to drive the new computers is expected to add significantly more to the overall bill.

And there could be more computers on the way at the Department of Transport, this time in Local Traffic Offices. The DoT is shortly to start a trial system at the West Midlands area office, based on an as yet unspecified minicomputer, and likely to be developed by computer staff at Swansea.

HP portable micro

by Kevan Pearson

HEWLETT-PACKARD is taking on Osborne computers with a portable microcomputer costing under $1,000 in the US. The machine is due to be launched in Europe next week, and as yet no price is available for the UK market.

The HP75C is aimed at business users, moving away from Hewlett-Packard's bias towards technical and scientific computers. And it is sized to fit comfortably in a briefcase. Its dimensions are 10 inches by five inches by 1.25 inches, and it weighs only 26 ounces.

It has one line of 32 characters, similar to those used on some word processors, and the company plans to introduce a range of peripherals, including modems, printers and cassette drives for the machine.

The new machine will fall in the middle of the range of portable computers. Some cheap versions, made in Japan, are available at half the price, but the main computer for business use must be Adam Osborne's Osborne 1, which is considerably larger than Hewlett-Packard's latest offering.

John McNulty (left) . . . "It's the Sinclair saga repeated." With him is Clive Sinclair.

Receiver in at Modular Tech

by Boris Sedacca

MODULAR Technology, the company headed by one of the more lively personalities in the data communications market, John McNulty, has gone into the hands of the receiver. But the company is still trading.

Stephen Rout, receiver's assistant at Chater and Myhill, said the company's doors were still open for trading. "The company still exists, it has not gone into liquidation."

Referring to Modular Technology's prospects for survival, Rout added: "We are still in the process of finding out but we are very optimistic."

McNulty is a long-time opponent of the British Telecom telecommunications monopoly, and his company is an independent supplier of modems and other data communications equipment for connection to the public telephone network, as well as laser-channel equipment for private data transmission. The company last year had a turnover of £500,000 and employed 17 staff.

According to McNulty, the company was profitable and growing but ran out of cash, and its financial backer, the Industrial and Commercial Finance Corporation, refused to put up more money, called in the receiver on July 29 and appointed him the same day.

"It's the Sinclair saga repeated," explained McNulty. "What this has taught me is that it is no good for an institutional investor to get involved in high-technology growth companies."

The company needed extra working capital to maintain its existing cash flow levels. "We could have sailed through if people had not dithered, but once this happens, confidence drops and the plug is eventually pulled. I'm worried now that customers are not being looked after while all this is going on."

McNulty insists that he is down but not out, but has not finalised plans for his company's financial restructuring with the receivers.

IBM slashes memory price

by Boris Sedacca

IBM has dealt a body blow to the plug compatible manufacturers in a flurry of memory price cuts last week for its 3033 processors. The company has cut the price of add-on memory by a staggering 35% from $25,000 a megabyte to $16,000. In the UK a less dramatic 20% has been cut from the price.

The UK drop in price is unlikely to have immediate effect, according to Derek Batey, sales director with PCML, an independent leasing company. He says that there is currently a two-to three-month waiting list in the UK for additional memory for the 3033.

According to IBM watcher Robert Fertig, president of Enterprise Information Systems in the US, this price cut, coupled with the recent 9% price cuts on 3033 maintenance charges, should extend the life of the 3033 considerably. It should also improve the residual value of the 3033 against the newer 3083 processor range, he says.

But the latest prices cuts are likely to lead to some confusion, says Fertig. "It seems illogical to cut memory prices on old products and not on the new ones, where technology savings are usually made.

"This leads me to believe that it is a temporary tactical manoeuvre on IBM's part to put pressure on the PCMs."

The move makes IBM's add-on memory very price competitive with that offered by the PCM memory suppliers in the UK, says Batey. The UK price for PCM memory is £10,000 a megabyte, but this will have to fall. There are already stock piles of memory in the UK, says Batey.

Way open for AT&T to hive off companies

by Howard Karten

AT&T and the US Justice Department last week accepted Federal District Court Judge Harold Greene's proposed modifications to the anti-trust settlement reached earlier this year.

The way is now paved for AT&T to begin divesting itself of its 22 operating companies, which it has been trying to do for several months.

AT&T now has six months to submit a detailed plan for spinning off the companies, and 18 months to implement the plan.

One of the modifications asked for by Judge Greene imposes a seven-year waiting period before AT&T may profit from transmitting over its own facilities information the company has generated itself. However, AT&T may still serve as a carrier for information generated by others, such as some of the publishers with which it is currently conducting field and marketing trials.

In Washington, Tim Wirth, chairman of the House of Representatives Telecommunications subcommittee, said that the revisions proposed by Judge Greene were "in the public interest".

Wirth's committee had been working on a rewrite of the historic 1934 Communications Act, which was recently defeated.

Another of the 10 modifications required by the judge included freeing the local companies to provide unregulated services such as data processing and enhanced communications, which AT&T itself has only been allowed to do through a separate subsidiary, American Bell.

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System en route to Moscow via UK

US stops computer for Russia

by Howard Karten

AGENTS of the Export Enforcement Office of the US Commerce Department last week seized some $70,000 worth of digital image processing hardware allegedly awaiting shipment to the Soviet Union. The hardware, a Comtal Corporation Model 8000-30 SER system, was in the US for enhancements and modifications prior to being shipped to Britain and then to the Moscow Institute of Geodesy and Cartography.

According to Comtal sales manager Roy Brugman in California, the 3M company subsidiary had originally sold the computer to a California firm acting as agent for Joyce Loebl, a subsidiary of Vickers of the UK.

Unknown to Comtal, Loebl then sold the system to the Moscow Institute with a valid licence for its export. The system had recently been returned to the US by Loebl for enhancements, primarily additional memory and software, Brugman said.

When the hardware returned to the US, it was accompanied by a Loebl engineer, who inadvertently indicated that the hardware had come from the Soviet Union and was on its way back there. At that point, Brugman said, Comtal notified the Commerce Department, which halted the removal of the hardware. The Customs Department then impounded it.

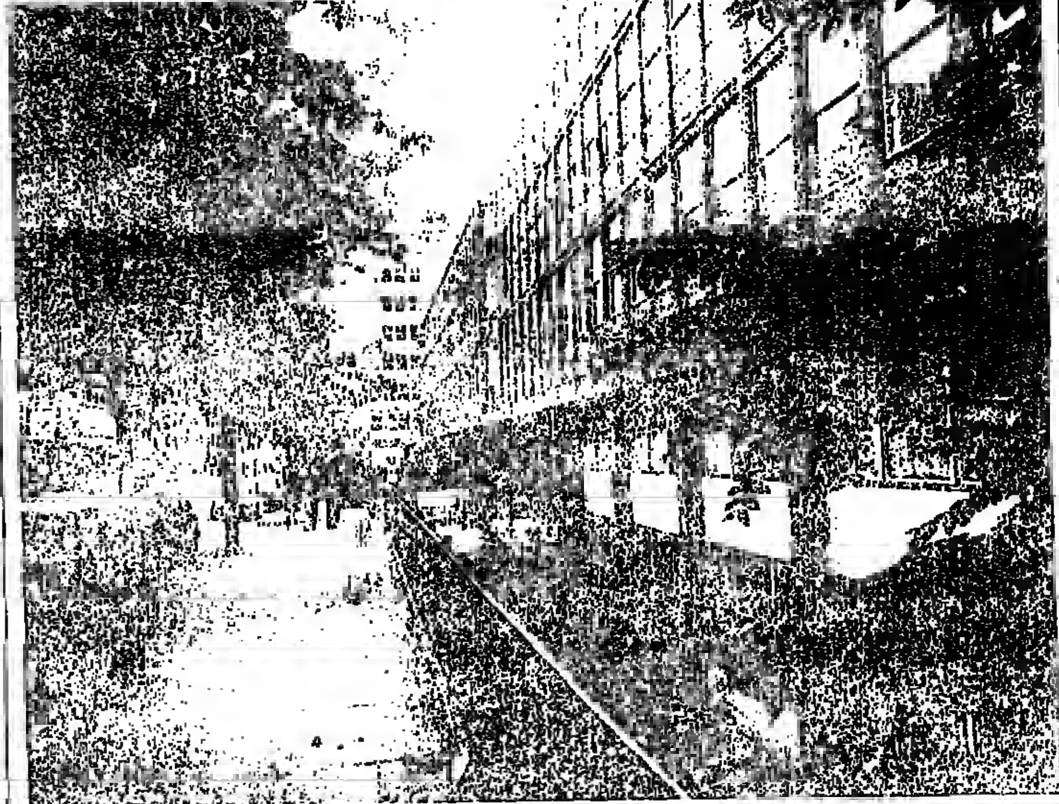
In reshipping the hardware to the Soviet Union, Vickers acted in violation of US law, a spokesman for the Commerce Department said. But the Comtal system had originally been exported under a valid 1979 export licence.

The hardware in question is image processing hardware and software made by Comtal and used for a variety of image-processing or image-enhancement tasks, such as sharpening or improving the quality of photos taken from high altitude aircraft or spacecraft. The applications for such a system include military intelligence, as well as others such as map-making, estimating crop yields, petroleum or natural resource exploration, and so on.

Comtal had notified Vickers that a new export licence would be required which listed the final consignee in Russia.

Despite that, Comtal received instructions from Vickers requesting that equipment be transported to an address somewhere in Massachusetts.

It was at that point that US government agencies took equipment from Comtal, with the knowledge of Comtal.



South-west Thames Health headquarters . . . More union troubles.

Hospital computerisation plan runs into union trouble

by Andrew Thomas

A SOUTH LONDON health authority is heading for more union trouble on top of the current NHS dispute for its million pound plans to put more computer applications in hospitals.

South-west Thames Regional Health Authority last week announced details of plans to computerise patient administration at its 13 hospitals, and is buying pre-packaged software from British Medical Data Systems by-passing its own DP staff.

Nalgo, the union representing clerical and computer staff at the authority is considering action over the fact that its members were not consulted before the decision was made, despite the fact that staffing levels at the hospitals are likely to be affected.

"Consultations haven't taken place at a grass-roots level," said a Nalgo spokesman, and a Cohse spokesman added: "Pending an agreement on new technology, all unions are adopting a policy of non-co-operation."

South-west Thames regional administrator, Tony Kember, maintains that hospital administration staff knew that computerisation was on the cards.

"The staff knew that this was our policy," he said, "but we obviously didn't consult them at the tendering stage."

"Manning levels will have to be reviewed," continued Kember, "and a number of hospital staff may be redeployed."

The £1.3 million, two-year pilot project involves the use of British Medical's Action software, running on DEC VAX 11/750 and 11/780 hardware.

The first machine is due for installation at the authority's South London computer centre at Tooting in October, followed by Frimley Hospital next April, and St George's, Wandsworth in April 1984, but unless union attitudes soften, the machines may well stand idle.

NEWS BRIEF

Itel back in business

BANKRUPT Itel Corp is rising again, selling software for minicomputers. A new company, Itel Software Services, has been formed and is attacking the DEC and DG market for systems software and productivity aids in the UK.

For the full story, see Software File, page 6.

HP $100m profit

HEWLETT-PACKARD has driven quarterly profits up 32% to cross the $100 million barrier for the first time. Profit for the May to July period was $105 million, and the company improved turnover by 18% to show sales of $1.1 billion for the quarter.

Tenfold increase

CONVERGENT Technologies, US manufacturer of desk top 16-bit micros, has turned last year's first half loss of $271,000 into a profit of over $3 million this year. Revenues for the second quarter were nearly $16.5 million, a tenfold increase over the same quarter last year.

Conference

BIENNIAL International Conference on Computer Communication takes place in the UK for the first time next week. Running from Tuesday to Friday, it will be held at the Barbican Centre and is hosted by British Telecom.

Talking 8100

IBM has enhanced its 8100 distributed processor system with additional communications facilities. The new facilities enable 8100 to talk to the Displaywriter word processor, the Series 1 mini computer and the 5280 distributed system.

£12m cash and profitable trading prepare UPL for privatisation

GREGORY . . . Became chairman earlier this year.

by Kevin Cahill

A MOVE into profit and deliveries worth £28 million this year looks set to convince sceptical MPs that the British Technology Group's United Peripherals subsidiary is a viable concern – but £12 million of public cash was needed to make it one.

Earlier this year Tory backbench MP Michael Grylls had questioned Industry Minister John Butcher about the £20 million in losses which Data Recording Instruments, the BTG subsidiary used to channel investment into UPL, showed for the years 1980-1981. UPL is a joint investment between DRI and American peripherals giant CDC.

The losses at DRI, attributed in the BTG accounts to start-up costs at disc manufacturer UPL, had finally necessitated a £12 million cash injection into DRI to stabilise that company's balance sheet.

According to Peter Gregory, who took over as chairman of both DRI and UPL earlier this year, the £12 million was needed to prepare DRI for privatisation.

"UPL needs a two-year track record to be attractive to investors," he said. "With the £12 million injection the balance sheet is cleared of bank debt and overdrafts."

Putting money into DRI rather than UPL was necessary because DRI carried UPL's start-up costs.

The UPL factory in Winsford, formerly an ICL facility, now employs 550 people, a useful addition to employment in an area which has been badly hit. Over 1,000 jobs were lost when ICL closed its factory.

The principal output from UPL at the moment consists of two CDC 14in Winchester discs known as Hawk and Phoenix, and about 500,000 printed circuit boards mostly for CDC plants in Europe.

A state-of-the-art 8in Winchester disc unit to be called the Windsor, and known in the US as the Meadowlark, will be completely developed and built for US and European markets by UPL, design royalties going to CDC's Memory Products subsidiary.

● See page 9 for a report on UPL's current production and plans.

INSIDE THIS WEEK'S ISSUE

Prestel to give free adaptors for 100,000 more homes

by Donald Kennett

PRESTEL is aiming to put its service into 100,000 more homes, by giving adaptor sets free to customers of an as yet unnamed high street financial institution.

But the British Telecom subsidiary is staying coy about its plans, described as "being in a delicate stage of negotiation," to boost the number of its users from less than 20,000 to 120,000.

The adaptors would have full alphanumeric keyboards and the application is described as a fully interactive home banking type operation.

Banks and building societies are known to be looking closely at electronic methods for expanding business without expanding staff and, particularly in the case of regional organisations, for expanding territories faster than they can open new offices. It has also been pointed out that each time the bank rate changes, about 12 million people send letters through the post to their banks to change their standing orders.

In West Germany the Verbraucherbank has already found viewdata useful for providing services to its customers, even though the public viewdata trial is not due to become a full nationwide service until next year.

In the US, stockbrokers have ordered portable terminals to give to clients so they can get information on stock movements from databases rather than tying up brokers' time.

A Prestel spokesman described the UK project, which is being referred to as Project Y, as a result of the Department of Industry's "Commitment to Teletext and Viewdata" conference in February, at which the industry agreed that full use of viewdata's interactive capabilities would have to be made in penetrating the residential market. "Information alone is not enough," he said.

The corporation is also discussing a separate project with a clearing bank which may lead to an announcement later this year. Details of funding are still being discussed. For Project Y, decisions still have to be made by the boards of both British Telecom and the financial organisation.

Trustee Savings Bank is to become an information provider on Prestel this month, but is not the organisation behind Project Y. "I wish we were," a spokesman said, "but we have been a bit slow with Prestel and are still at the education stage. It seems to be a very good method of home banking, provided there can be adequate safeguards. Secrecy depends on passwords and passwords can be broken."

Tandata Marketing, the leading supplier of viewdata adaptors, confirmed that it has bid to supply 100,000 units for a home banking type application and was hopeful of getting the contract. Managing director Peter Harding declined to reveal his price and said that nobody had bid at the £70 unit price which has been suggested.

Dixons' Advanced Consumer Electronics subsidiary, which has its adaptors made in Hong Kong and mainland China, has not been approached, although managing director David Rurka said that five months ago Prestel director Frank Burgess had asked him if he would be interested in quoting for a 100,000 unit order and he had said: "Yes, obviously."

His quote would be in the £50 to £70 each range, he added. ACE's range does not include an alphanumeric keyboard, but Rurka said that for a 100,000 unit order it would be easy to bung one on.

KELMAN . . . "This Bill will give you an extra leg on which you can sue."

US Bill to strengthen legal protection of software

by Nicholas Enticknap

AN attempt to provide further legal protection for software producers is to be made in America later this month. Legislation to amend the Federal Copyright Law has been introduced by Congressman Robert Kastenmeier, who is chairman of the House Subcommittee on Courts, Civil Liberties and the Administration of Justice.

The sub-committee will start considering the Bill when it returns from its Labour Day holiday, which is next Monday.

The Bill is supported by the Association of Data Processing Service Organisations (Adapso), roughly the equivalent of Britain's CSA.

Software is theoretically already protected by US copyright legislation, but the existing provisions are, in the opinion of many commentators, unclear, which means that anybody wishing to take action risks an expensive lawsuit with nothing to show at the end.

The Kastenmeier Bill contains four important provisions designed to improve the position. First, it will incorporate the World Intellectual Property Organisation (WIPO) definition of computer software into the copyright law. This is slightly wider than that incorporated in the existing Act, in that it concentrates on protecting the idea rather than the form in which it is expressed.

Secondly, it provides that the use of a copyright mark on unpublished software does not constitute publication of the material. Thirdly, it establishes a procedure for the secure deposit of computer software within the Copyright Office.

Finally, it specifies that copyrighting does not disqualify a program from protection as a trade secret. The significance of this is explained by one of the UK's leading authorities on software protection, Alastair Kelman.

"Under US law a literary work, including software programs, cannot be a trade secret as well as a copyrighted document. This Bill will change that and will also give you an extra leg on which you can sue — that is for stealing a trade secret as well as violating copyright."

Kelman added, "The deposit provision is what the whole thing's really all about. It will mean you can't just walk in to the Copyright Office and have a look at somebody else's copyrighted program".

Jerome Dreyer, president of Adapso, commented, "The law cannot, in and of itself, stop the proliferation of software piracy, but it will make proof of this type of theft easier. Therefore, software developers of all types will have the opportunity to gain restitution from those that steal their work. In the long run this legislation should reduce the number of thefts."

In the UK, action to give legal protection to software developers is far less advanced. The government introduced a Green Paper on copyright, covering software, last summer, but no further action has yet been taken.

Program languag announce Inmos

by Robert Parry

INMOS, Britain's publicly semiconductor firm, has into software.

It has announced a pro gramming language desi its long-awaited transpu

The language will have rency and simplicity keystones, says an spokesman. It is intended generally applicable and wide range of equipment.

Its development has heavily on the work of Hoare, professor at Oxf versity, on communicat quential processes. Hoare a consultant to Inmos early days.

Transputers, first mentio Iann Barron back in 1977, nmos' vision of the futu microprocessor devices. The include numbers of process ments on one chip, sto large amounts of memory, guage supporting a high de

HOARE . . . Drawn on

concurrent operation wi vantage of the efficient cessor communication by different processes to be to different processors on

Inmos will be releasing tion packages for the lang which it coyly keeps for the moment — later It hopes this will encourage eral acceptance and so potential of the transputer they appear in 1984.

Atlantic Software goes transatlantic

by Robert Parry

MICROCOMPUTER hardware and software supplier Keen Computers is going transatlantic to focus on its twin enthusiasms Unix and local networks. Atlantic Software, a wholly owned subsidiary of Keen, is to operate on both sides of the Atlantic and in Australia.

Keen specialises in local network and the Unix operating system markets, through its dealerships of Apple and Corvus hardware, and intends that Atlantic Software should act as a clearing house for software products that fit in with these interests.

"The priority is looking for sound Unix products," says Atlantic Software's marketing director Chris Knight. "There's so little of it around". At first the emphasis will be on software for the Unix machines Keen Computers handles — the Onyx micro and Plexus mini — but Knight aims to extend the range of machines he will cater for.

Atlantic will also develop software for Keen's other hardware lines, with products for Apple micros networked through Corvus' Omninet and for the Corvus 16-bit micro, the Concept. The main package for the Concept will initially be a library of subroutines for software houses to use to put together applications packages for end users. The Concept runs under its own operating system, and Knight sees a strong need to promote the writing of applications software for it.

KEEN . . . "Must concentrate."

Until now such software activities have gone on inside Keen Computers. With the setting up of Atlantic Software, the new company will take over the work and supply software for Keen. This will include standard CP/M products from Microsoft and MicroPro, UCSD Pascal for Apples, and the range of Unix products from US Interactive Systems for the Onyx and Plexus machines.

The reason for setting up a new company, rather than expanding the software side within Keen Computers, was management controls says Tim Keen. "To make a success out of software you have to concentrate on it," he says. "It doesn't work as part of another operation."

Apple protects patents

APPLE Computer of California has taken legal action against four Hong Kong companies which have allegedly been infringing its patents, copyrights and/or trademarks.

Court orders have been issued restraining Lux Electrical and Maxland Electronic, both of Hong Kong, from infringing British letters of patent and rights. Charges are pending against two other small Hong Kong companies.

An Apple spokesman explained that suing for compensatory or punitive damages in Hong Kong is difficult "and not like it is in the US." In addition, most of the companies involved are small operators.

Apple's intent in seeking restraining orders but not monetary damages is simply to demonstrate that it is serious about stopping the pirating lest bigger pirates move in, the spokesman explained.

'Extortion plot' arres

THE FBI has arrested a California man in connection with an alleged extortion plot against Control Data Corp and Burroughs' Memorex subsidiary.

Ira F. Gassman, a former Burroughs engineer, was charged with trying to extort $113,000 from Disk Media Inc, a joint venture of CDC and Memorex. According to Justice Department documents, Gassman contacted a CDC vice-president earlier this summer with a threat to sell to the Jap disc coating formula, develop DMI, unless he was giv $113,000.

A CDC spokesman said th Minneapolis firm "followed standard Industry practice of fying the FBI when such as this occur." CD operated with the autho apprehending Gassman.

Gassman faces a maximum alty of a $500 fine.

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BT modest over 25% jump in turnover . . .

by Donald Kennett

BRITISH Telecom has played down the enormous 25% jump in its turnover, published in its annual report and accounts last week. In the chairman's statement, Sir George Jefferson refers to the rise — from £4.6 billion last year to £5.7 billion this year — as "a net overall growth in real terms of approximately 5.6%".

The "real terms" does not mean that inflation was 19% last year, but that BT has disallowed that part of the turnover resulting from tariff increases. BT regards this as providing a more realistic indicator of the growth of its business.

Profit showed a better than threefold increase to £458 million from £124 million last year and exceeded the government's target of a 5% return on assets by 1.5%. These results were delayed by several weeks while BT conferred with the government.

BT is faced with the dual problem of answering criticism for raising charges, while making record profits at the same time as boosting its performance enough to make its shares saleable if it becomes a public limited company after the next election.

The City financial community was waiting eagerly for BT's report and accounts to see evidence of BT being a saleable proposition.

Investment analyst Mike Whitaker of stockbrokers Simon & Coates said: "Ministers seem to assume it can be sold at a high value because of its asset backing. But people will look at the profits to make their assessment of market value — and this could be as low as £2.5 billion."

It would be unrealistic to sell it at this valuation, apart from any other reason because the pension fund deficit of £1.25 billion would wipe out the best part of the proceeds of the sale. It would also realise the BT unions' worst fears that the national asset of BT's network will be sold off at knockdown prices.

The alternative is that BT's performance be put on an almost unimaginably strong growth path so as to give it a realistic market valuation in time for the sale.

The chairman said that the growth was significantly less than had been assumed in plans made two years earlier. The board was concerned at the uncertainty the government was bringing about by using enabling legislation to make changes to the environment in which it operated, he added.

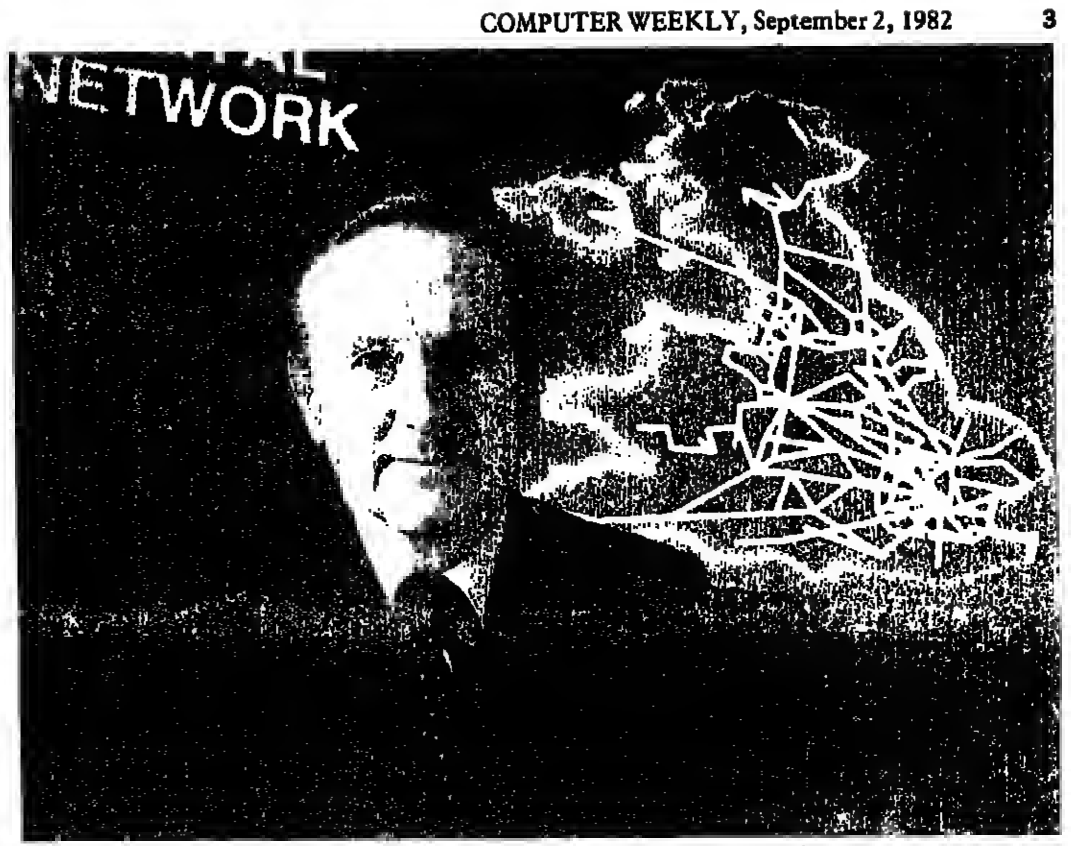
The board would continue to campaign for an environment conducive to BT's positive development, said Jefferson. He believed BT was responding well to its new environment.

BT's accounting methods have been criticised by many — including the chairman — on the grounds that they made it difficult to tell what individual services cost to run. The corporation is being restructured around profit centres, but a number of costs are now being treated differently.

Installation costs for customer equipment are being charged against profits at the time they are incurred, rather than over a period of years, and the equipment itself is being written off over a shorter period. This resulted in £972 million being taken off the asset figures.

But despite this, total assets rose from £7.4 billion to £8.3 billion. Conventional fixed asset accounting methods have now been applied to £5 billion of the total.

BT modem installations grew by 14% to 93,000. Faults reported dropped by 3% and computer-based measurement and analysis centres were installed in all telephone areas. A total of 194 electronic exchanges were installed during the year and 35% of BT's customers are now served either by electronic or crossbar exchanges.



JEFFERSON . . . Telecom's growth is only 5.6% if you don't count revenue from price rises.

The number of connections on the telephone network rose by 3% or 544,000, and on the telex network by 2.2% or 2,000. The number of nodes in the SwitchStream One packet network grew from nine to 14 during the year.

Waiting lists shortened considerably. The number of people waiting for telephones fell from 322,000 to 185,000 and those having to wait more than two months for a line fell from 122,000 to 20,000. Those waiting for telex lines fell from 6,600 to 3,650 and 72% of small orders from businesses were being filled within two weeks by the end of the year.

. . . as union campaigns against privatisation

by Nicholas Enticknap

UNION response to the British Telecom annual report was to emphasise the workforce's strong opposition to the government's privatisation plans in the first of what is planned to be a series of statements. It presages the launch of a major campaign against the plans next week, which is TUC annual conference week.

The campaign is aimed to publicise the British Telecom unions' arguments against privatisation, based on evidence which the British Telecommunications Union Committee (BTUC) was planning to submit to the Department of Industry last Tuesday (August 31).

The BTUC represents six unions covering all grades among the 250,000 British Telecom workforce. It was formed a year ago when British Telecom was separated from the Post Office, with a brief to represent the six unions on matters of common concern and to co-ordinate action between them.

The government's privatisation plans, which are not due to be put into effect until after the next General Election, is the first major matter the BTUC has dealt with.

The thrust of the campaign can be gauged from the remarks quoted in the statement just issued. Contrasting the profit of £458 million quoted in the report with British Telecom's annual investment requirement of £2.25 billion, BTUC chairman Bryan Stanley says, "This profit figure is a fifth of the investment needed, and private shareholders would be in the front of the queue to grab the largest slice".

Stanley, who is general secretary of the Post Office Engineering Union (POEU) is supported by his counterpart in the other major BT union, the Union of Communication Workers.

Alan Tuffin is quoted as saying: "Under private ownership profit will call the tune, and the music will be switched off on unprofitable services — like call boxes and rural phones."

BTUC secretary Alan Chamberlain strikes a similar note. "Government policy means prices going up and only a service for some. Private profit is the exact opposite of public service".

Atari wins US schools deal worth up to $13m

by Howard Karten

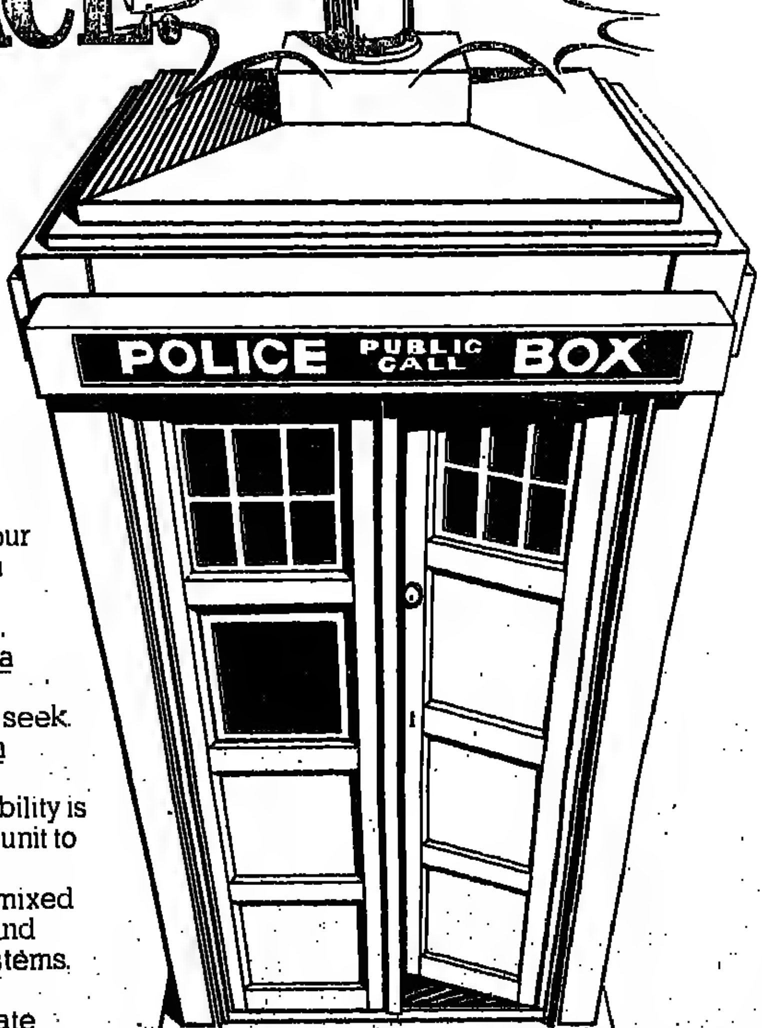
THE Department of Defence in the US has awarded Atari of San Jose, California, a contract that could potentially be worth up to $13.35 million. An Atari spokesman guessed that the order, which calls for between 100 and 1,374 Atari 800 systems, was the largest single educational order the company has yet had.

Like most other microcomputer manufacturers, Atari has been active in the education market. The firm recently sold some 426 Ataris to Dade County, Florida, which already had 225 Atari systems used in education. Similarly, Atari recently sold a large number of computers to the Minnesota Educational Consortium, MEC, one of the country's leading educational computer users.

The Atari spokesman declined to estimate Atari's share of the burgeoning education market nor was he able to ascertain against whom Atari was competing in the DoD order. A Defence Department spokesman said that information would be available only through the filing of a Freedom of Information Act request.

The Atari computers will be used overseas in Defence Department dependent schools computer education programme. The dependent schools, located overseas, use standard US current (60 Hz, 115 volts) so no modifications to the computers will be required.

In related news of Atari, the company announced that it will begin marketing its computers in the autumn through the K-Mart retail chain. K-Mart is a US national retailer specialising often in lower-priced, mass marketed goods.



HOWLETT . . . Starting with proven products.

CMG puts its money into software products

by Nicholas Enticknap

ONE of the UK's leading bureaux, CMG Computer Management Group, has decided to follow a growing trend and diversify into software products.

The company has been marketing products on an ad hoc basis for some time, but has now decided to make a major thrust into this area with the formation of an Information Products Division.

The new division, which became operational yesterday (Wednesday), will benefit from investment of what CMG describes as "a substantial proportion of a £3 million budget over the next three years". This compares with the group's turnover in the last financial year of £16.1 million and profits of £1.6 million.

The division is headed by John Howlett, previously joint managing director of the group's City of London subsidiary.

Howlett commented, "We are starting with a number of CMG 'own' proven products for areas such as banking, investment management, commodity and money broking. However, we hope to soon be adding more CMG and OEM products".

The initial products are Microbank, a low-cost banking system running on the Star Auditor system; Microbroker, a system for commodity brokers running on North Star micros; and Invest 3, a system for investment portfolio management running on Computer Automation SyFas.

Ron White, CMG UK general manager, commented, "Our own and other recently conducted surveys of the European software market show a 40% per annum growth in the market for turnkey products to at least 1985. This is twice the expected growth of the traditional areas for computer services, so naturally we want to capitalise on this market."

Viewdata a pawn in US TV advertising

by Donald Kennett

THE US government is using viewdata technology as a political football in a squabble with Canada over radio and television advertising.

The US wants Canada to change its policy of disallowing tax relief on advertising fees paid to US broadcasters for advertisements aimed at Canadian audiences. There would be no point in copying the Canadian legislation because few US advertisers use Canadian broadcasters to reach US markets. So instead it is considering denying tax relief to purchasers of Canadian viewdata or teletext equipment or services.

Canada is not mentioned by name in the proposal, an amendment to a Bill currently being discussed in both Houses, but is defined as "a foreign country which denies a deduction for the cost of advertising directed primarily to a market in a foreign country when placed with a US broadcaster".

The proposed amendment has hit where it hurts, because Canada hopes to sell a substantial proportion of its output to Telidon hardware and software to the US. The Canadian government has protested.

Meanwhile, the education subcommittee of the Canadian Videotex Consultative Committee has called for federal and state governments alike to back research into educational applications for Canada's Telidon viewdata and teletext systems. The committee believes that the government should be commissioning educators to help find applications for Telidon.

It recommends that the government Department of Communications make about 1,000 Telidon terminals available to schools free of charge and fund the production of course material and bi-lingual databases.

Such a move would steer current software development towards compatibility with Telidon and would result in the production of networking and database software which could be distributed to other public sector institutions, in the committee's view. It would also ensure that cultural control of Canadian videotex education material stayed in Canada, a subject many Canadians are sensitive about.

British Telecom checks in with a service to fight credit card fraud

by Nicholas Enticknap and Donald Kennett

CREDIT card frauds, which in the UK currently account for £12 million a year, have provided the new entrepreneurial British Telecom with an opportunity to launch another service. This enables high street stores to check any card tendered with the issuing company's computer system, and so not only detect fraudulent usage, but also provide credit verification which previously required a phone call, often lengthy, from the shop assistant.

The service will initially be available in well-known stores such as Selfridges, Harrods, Harvey Nichols and Austin Reed, and will relate to American Express and Barclaycard transactions. British Telecom expects to have about 1,000 of the so-called transaction telephones installed by early 1983, and to extend gradually the credit cards covered by the scheme.

Access and Diners are expected to be the next to join it.

The first transaction telephones to be installed are the Racal-Transcom TCL 100 devices. Comparable products from Ericsson, STC and Ferranti-GTE are currently in the final stages of evaluation, says British Telecom.

The software inside the telephones, which enables them to communicate with the various credit card companies' computer systems, has been specially developed by British Telecom.

The project was led by American Express, which has previously installed a network of 100 card-reading terminals from Standard Telephones & Cables to link customers via leased line to its computer centre in Brighton. It also pioneered host-to-host links between its centre and the mainframes at the hub of the point-of-sale networks operated by large retailers such as Army & Navy Stores.

In the US, American Express set up the first automatic credit authorisation networks and later switched traffic through to other credit card houses via its front end processors.

UK credit card companies were reluctant to be dependent on a rival in that way and the development of transaction telephones promised greater flexibility, particularly with SwitchStream One as the access medium.

BT has bought two £5,000 Gandalf PADs (packet assembler-disassemblers), one for London and one for Edinburgh, from Camberley-based Master Systems to accept calls from the terminals across the public telephone network and connect them into the packet network.

SALES BRI

Ford insta private viewdata

FORD Motor Company h lowed BL and Talbot by in a private viewdata system t its 450 main dealers up-to vehicle availability.

The system is based on a K sion 1800/50 computer ru Rediffusion's Viewdata Pl ware and the terminals supplied by Thorn EMI under Radio Rentals Contract.

PO database

THE Post Office has retain ley-based Orion Software to a national database on its b customers and the special e they use. Orion had been in in three regional pilot da formation projects over the two years, the results of which gest that the national datab enable the Post Office to ma marketing more effective, im its services and increase traffi

Midas touch

HIS SOFTWARE has won a worth £161,000 for its b banking system to be insta the London branches of two seas banks, the National Ba Canada and Hanil Bank of K The NBOC order could b repeat orders for branches in treal, New York, Hong Kong Nassau.

Nigerian deal

TURNBULL Control Sys Worthing has compl £120,000 contract to equi ness' Nigerian lager brewery microprocessor-based temper control equipment for b process vessels.

Printers for Lif

PROVIDENT Mutual Life As ance has ordered seven Fuji 830 daisy wheel printers, w nearly £14,000, from Zygal Dy namics of Bicester. The pr will be attached to the comp NCR 8565 mainframe and initially to produce prospectus new life insurance business later for policy documents.

Same again

GUEST Computer Services wun a repeat order from Br Aerospace Dynamics for t databank system to protect data from all the quality as sections in its Bristol w weapons factory. The DEC system is based on a Gen mini with a 64 Mbyte disc dri will exchange information with original system in Stevenage.

RAE installation

THE Royal Aircraft Est lishment, Farnborough, installed a £56,000 Micro Con tants Intellect 200 modular im processing sytem for research development work on optic electro-optical sensing systems

Fast link-up

STANDARD Chartered Bank ordered Codex V.29 fast-poll bit-per-second and LSI 4,800 modems to link seven branches in London to head and to replace some of the Codex Series modems that it has since the early 1970s.

£133,000 order

DATAPOINT has won a £133,000 order from Yorkshire Imperial tings for a distributed sales processing system based on ARC local area network system will incorporate and three 8600 processors under Datapoint's RMS system. It will also handle control and invoicing and data to an IBM 370/148 database.

COMPUTASTARS

EUROPEAN FINALS
BRUSSELS
SUNDAY 10TH OCTOBER 1982
SPONSORED BY
Rendeck

In conjunction with Computer Weekly

Free tickets for the finals

THE Belgian national stadium is the venue for this year's European final of Computastars.

Du Heysel Stadium is to the Belgians what Wembley is to the English, and this setting should add to the sense of occasion as teams from the UK, Holland and Belgium take the field to do battle for the Euro-honours.

As an incentive to all you camp followers out there, the organisers have arranged a free ticket offer for readers of Computer Weekly. Simply fill in the form below and send it to either of the addresses shown, and the required number of tickets should soon be winging its way to you.

CW's sports reporter will be there to add a touch of class to the meeting, so don't delay, send off today.

Please send me ...... free tickets for the European final of Computastars.

Name ....

Company ....

Address ....

....

....

Send to Computastars, 117B High Street, Croydon CR0 1QG or Rendeck, Trafalgar House, Nelson Street, Southend-on-Sea, Essex.

Qualifying teams

Group 1: Sheffield Insulating (GB), small unit, Informatikum (NL), small unit, Data General (NL), veteran, Rowntree Mackintosh 2 (GB) veteran.

Group 2: Consulting Associates (NL), Rowntree Mackintosh 1 (GB), Philips Corporation (NL), Barclays Bank Radbroke Hall (GB), BSO Apeldoorn (NL)

Group 3: Legal & General Assurance (GB), Rendeck (NL), Barclays Bank International (GB), Caterpiller (B), Commercial Union (GB).

Group 4: Kalamazoo 2 (GB), ARC Automation Services (NL), NPI (GB), Burroughs (NL), ADP Benelux (NL), Control Data (B).

Group 5: Janssen Pharmaceutica (B), Swets En Zeitlinger (NL), CMC (GB), Digital Equipment (NL), Kalamazoo 1 (GB).

Group 6 Ladies: Digital Equipment (GB), CMC (NL), Digital Equipment (NL), Barclays Bank Radbroke Hall (GB).

Group 7 Ladies: Kalamazoo (GB), Control Data (B), Centraal Beheer (NL), Control Data (NL), Legal & General Assurance (GB).

Whether you prefer running about or standing about, Computastars has something for you.

Top job for bank's computer director

by Kevan Pearson

IT is not often that a computer man makes it to the top, especially in the realm of modern banking, but that is what has happened to Bert McKim, a director of the Royal Bank of Scotland and managing director of the bank's computer development subsidiary.

McKim will head the newly-formed development company to oversee computer developments and applications at both the Royal Bank of Scotland, and Williams & Glyn's Bank, which operates mainly South of the Border. He will retain his position on the board of the Royal and will also join the board of Williams & Glyn's.

"It is tremendously reassuring to me that both banks recognise at board level the importance of computing. In many banks you find data processing people being excluded from the board," said McKim.

"It is a recognition of the impact that new technology will make in the banking of the future."

McKIM . . . "Recognition of new technology."

The new company will not be taking computing away from the individual banks, McKim says. Its main function will be to oversee the development and integration of the individual systems, and to ensure that the banks are able to take advantage of computer development as a group rather than individually.

But both banks will retain their own computer departments, and their own DP managers, who will join McKim on the board of the new company.

The two banks, like the other major banks in the UK except for the Midland, depend heavily on IBM mainframes. But they have not, unlike NatWest, Lloyds and Barclays, rushed headlong to embrace IBM's latest and expensive offerings.

Both use a mixture of IBM 303X systems, and they will be adding a few more 3031s this year. The progression to IBM's 308X series will be at the banks' own pace.

Storage Tech drops two major products

by Kevan Pearson

STORAGE TECHNOLOGY, the Colorado-based IBM compatible disc manufacturer, last week sorted out its US finances with a $25 million debenture repurchase, as it dropped development of two major products.

The debentures, part of $100 million issue convertible into STC ordinary shares, will be redeemed over the next few weeks at a "favourable" rate, according to STC chairman Jesse Aweida.

STC has dropped two of its newer and more contentious developments. First, it has abandoned development of its Virtual Storage System, designed to improve disc capacity utilisation.

The company has now confirmed that it has dropped plans to launch a laser printer. The machine was to be made by Documation, the printer manufacturer which STC took over in late 1980.

A company spokesman said that VSS had been dropped because the need for the product had vanished with the drop in the price of disc storage. "VSS has been overtaken by new developments in disc technology, particularly the optical disc which offers large scale, cheap capacity."

However, there have also been technical problems. A US spokesman said that the hardware for the system was not performing to specification, and there are unconfirmed reports of trouble with the system's software.

The result was that STC could not market the product at a price which it estimated would be acceptable to both itself and potential users.

The company is believed to have spent over $15 million on development for the system, and would have to have spend much more to bring the product to the market.

The company plans to launch an optical disc system in 1984, according to a spokesman, and it hopes to market a product which has up to four gigabytes of storage on a single platter, compared to 2.5 gigabytes in an entire 3380 disc drive. This product should be announced early in 1983, a spokesman said.

There were no technical problems with the laser printer. It performed to expectations, but cost too much to develop and would be priced too highly compared to other products already on the market. The product was originally intended to compete with IBM's 3800 laser printer, and reports of its impending launch were leaked several times during 1981, but it never appeared.

STC took over Documation following its financial collapse in 1980. That year Documation made a loss of $9.5 million on sales of $90 million. Documation has a factory in Ireland to manufacture printers.

STC's latest venture is to launch an IBM 308X compatible mainframe. The company has set up a separate subsidiary to develop the system.

It plans to design and build its system itself, which would be a major departure for a plug compatible manufacturer. Both Amdahl and National Advanced Systems, the two major contenders at the top of the PCM market, rely heavily on Japanese technology.

New firm set to launch 'fastest' 16-bit micro

by Robert Parry

A MULTI-USER 16-bit microcomputer, claimed by its maker to be the fastest around, is due to hit the UK by Christmas. New US company Euclid Computer of Torrance, California, will launch its first product, the E-1, in a fortnight, and the UK is to be its first foreign market.

"We will be distributing in the UK some time in the last quarter of 1982," says Euclid's president and founder, Fari Hamzei. "We can't wait any longer because ours is leading edge technology, and there are people running behind at 50 miles an hour."

He sees Britain as the most promising European market for his machine as he reckons the price and performance it offers — $6,000 for a fast four-user system — will attract interest here. "It is really a function of the economy. The Thatcher government makes you look hard at resource allocation."

The E-1, designed by Hamzei's 17-year-old brother, is based around the leading 16-bit microprocessor, Intel's 8086, and runs at 10 MHz with no wait states needed for memory to catch up with the processor.

Fancy design work rather than expensive high speed memory chips achieves the true 10 MHz operation, says Hamzei. It runs the MP/M-86 operating system.

Kourosh Hamzei, designer of the machine, started dabbling in electronics when he was 10, but did not start working on microcomputers until 1979, when his brother brought him out of Iran. "His main interest is communications," says Fari Hamzei, "this is just an offshoot."

But it is an offshoot that tempted Hamzei away from his job as a strategic planner with Northrop to set up Euclid Computer in July this year. "Kourosh started working on an Apple, but got bored with it so developed his own Z80 system," says Hamzei. "He then moved to 16-bits, designing an 8088 system — which turned out to be a failure — and the 8086 system."

SOFTWARE FILE

by Maggie McLening

Census data up for sale

IN CASE anyone was wondering what became of those mammoth census forms we all had to struggle through last year, some of the information has resurfaced at SIA Computer Services and is for sale on magnetic tape.

SIA has been given exclusive distribution rights for digitised boundary data by the Department of the Environment, and is also in the process of acquiring census data from the Office of Population Censuses and Surveys.

"The DoE paid to have ward, district and boundary data collated and digitised about 18 months ago," said Upl Patel, head of SIA's statistics group. "We are now offering this information for sale on magnetic tape, or on our bureau facilities. Customers will be able to use this in conjunction with the census data, which we are in the process of acquiring now."

The combined information is of value to local authorities or county councils to help in siting schools or other public amenities, and would also be useful for commercial companies planning building work or retail outlets.

Non-profit making organisations needing the information for internal use would pay about £107 per boundary, while commercial users will be charged £150 if the data is for internal use. Other bureaux will have to pay £225.

Census data pricing is similarly complicated, but for one complete district, which contains around 3,000 items of information, the price is £1.20, plus the cost of the magnetic tape and copying charges.

Additional information including 1971 parish boundaries, inner city partership areas, enterprise zones, new towns and national parks will be available on SIA's census service, Censir.

Itel is alive and well and selling mini software

ITEL, the bankrupt US hardware leasing company, has resurfaced in the UK selling software packages for minicomputers.

Itel Corporation filed for bankruptcy in the Federal Court in January 1981, and as a result Lloyd's insurance underwriters have paid out the largest amount in Lloyd's history in settlement of claims. Some of the profits from the new software company will be used to repay the parent company's creditors.

Itel Software Services (ISS) was set up by its managing director, Donald Davidson, who has been European financial controller with Itel since 1969 and was involved in selling off business to National Semiconductor.

Selling software was his idea, and he intends to concentrate on Data General and Digital Equipment minis, rather than mainframes.

"The IBM world is very competitive and we would be crazy to start off against a giant," said Davidson. "Besides, there is a tremendous demand from users of DEC and DG machines for software. Most of the dealers in this country are OEMs, who are primarily interested in selling hardware. No-one is offering a full range of software products for DG machines."

Initially, ISS will be distributing packages from three US software houses – Information Processing Techniques, Access Technology, and Commercial Systems Corporation. ISS will start developing its own products early next year.

"We are really aiming at the system software and productivity aids area, to help the user get the most out of his machine," explained Davidson. "A great many mini users are finding their machines are under-utilised and would like to develop their own software, so we will provide the tools."

Software tools that ISS has available include Tracer, an interactive Fortran debugging aid which runs on DG Nova and Eclipse machines under the RDOS, AOS and DOS operating systems, and on DEC minis with RSX-11M and IAS. There is also a C Compiler for DG equipment.

DAVIDSON . . . "Aiming at systems software and productivity aids."

UCL offers agencies

SYSTEMS house Universal Computers (UCL) is offering first-time buyers of its systems marketing assistance for applications software they may develop together with a 25% discount on UCL's normal support fees.

The deal works on the same principle as that of mail order catalogue organisations which make their customers into agents. UCL includes the user's applications package in its software library, makes the user an agent for it and provides help with marketing.

"This is not a new concept," said Nick Drescher, managing director of UCL. "What is new is the lengths we are prepared to go to ensure that the organisation which wrote that software can benefit from its labours. Once the software has proved itself robust and efficient in the eyes of UCL's systems team, we will include it in our Universal Library of Applications Packages. Furthermore, we are to insugate a joint advertising scheme whereby these agents are eligible for a grant of up to 75% for media costs."

UCL supplies a range of machines running under the Pick operating system.

Memory 7500 boost

MULTI-USER facilities have been combined with CP/M compatibility in the new operating system developed by Memory Computers for its Memory System 7500 micro.

The standard CP/M operating system only offers program locking, which is adequate if each terminal is dedicated to a different task, but useless in a system such as one linking point-of-sale terminals, where several users are accessing the same file and can interfere with each other's input.

Memory Computers, the UK subsidiary of Memory Ireland, has produced Bridos to solve the problem. This gives full record locking facilities for up to eight terminals, and will support software designed for running under CP/M.

"Most of our sales of 7500 systems are to companies which want the full multi-user facility," said Graham Barrett, managing director.

Memory's announcement of Bridos coincides with the launch of an enhancement to the Memory 7500 which swaps the 1 Mbyte floppy disc back-up to the system's 10 Mbyte Winchester disc with 10 Mbytes of removeable storage.

SOFTWARE BRIE

Students ca win cash and kit in contes

ENTRIES are invited fr schools and colleges for the national computer software competition run by the University Kent. Sponsored by Barclays Bank, the competition is divided into two classes for students 16 and those under 19. The winner in each category receives a Software Trophy, £400 and £1,000 worth of computer equipment for their school or college.

Entrants are required to design and write a program with a practical application and, depending the quality of entries submitted number of merit prizes ranging from £10 to £200 will also awarded.

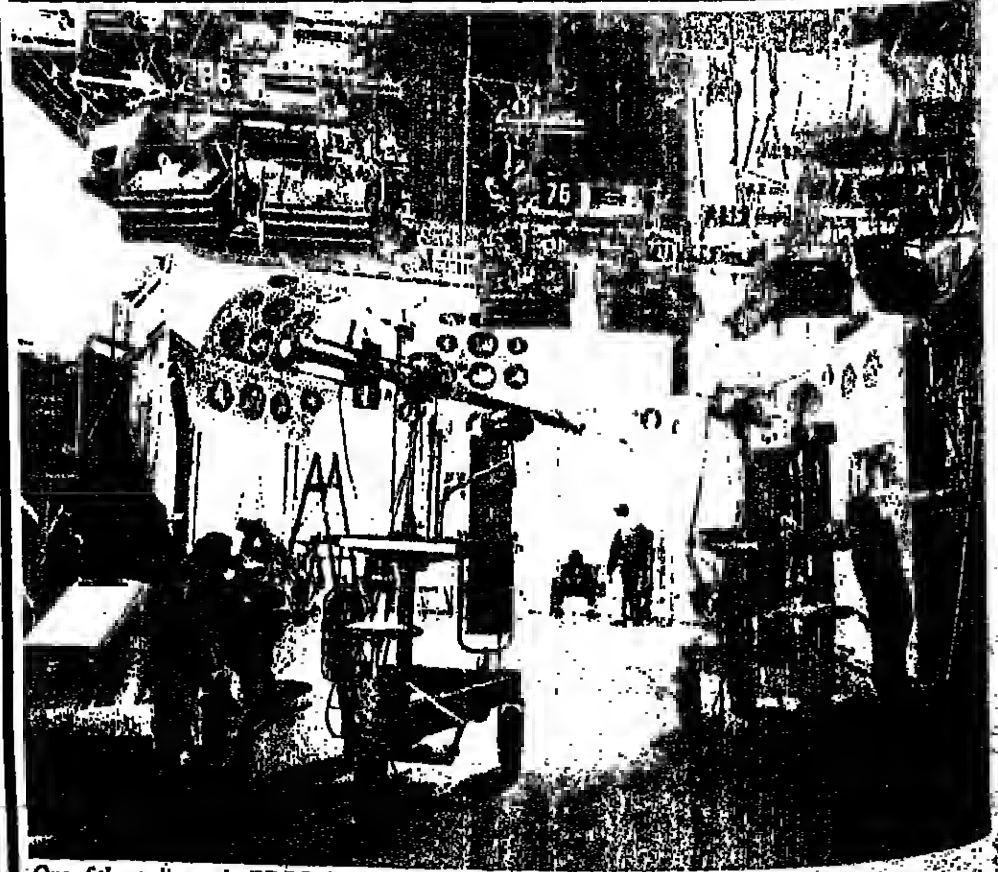
Closing date is February 1983. Entry forms can be obtained by sending a stamped addressed envelope to Kent Software Trophies, Computer Laboratory, University, Canterbury, Kent.

APL seminar

A seminar on current trends expected developments in APL to be held on September by consultants Cocking and Drury. special interest to APL users will be talks on IBM's newly announced APL2, the US scene and the availability of on micros. These will be given Romilly Cocking and Saunders.

Standard work

WORK will begin in October producing a standard for interfaces to relational database management systems. The American National Standards Committee X3, Information Processing Systems announced that work will start the X3H2 Technical Committee meeting from October



One of the studios at the BBC Television Centre in Shepherds Bush

BBC moves to Micropert

PROJECT management for design and installation of studio technical plant at the BBC is being handled by Micropert, Computerline's micro-based system.

The planning and information unit of the BBC studio capital projects department, which spent just under £20 million last year, has adopted Micropert as a low-cost alternative to the mainframe Pert package running on the BBC's 2900 equipment.

Project leaders, planning engineers and project managers use Micropert to show the dependency of various activities within a project and to allocate resources. It is used mainly to produce network logic drawings to show up critical activities which may cause delays.

A number of enhancements have been carried out by Computerline to tailor the package for the BBC, including adapting it to work with a Benson plotter and to provide plotted bar chart and resource analysis. The BBC will be using Micropert on projects containing up to 200 activities, although the system will allow up to 12,500.

Project areas include outside [illegible] telerecording.

"Good quality [illegible] is of paramount importance [illegible] requirements and [illegible] the system is for [illegible] pinpoint the elements [illegible] which are likely to [illegible] and so to prevent [illegible] said Ian Stone, [illegible] planning and information [illegible]

The BBC is running [illegible] on a Tandy TRS [illegible] micro, but Micropert [illegible] for other machines.

MICRO NEWS

by Robert Parry

HP makes portable micro 'legitimate'

HEWLETT-PACKARD'S launch last week of a fully-fledged portable microcomputer will do for that breed what IBM has done for personal computers generally. It will give legitimacy.

So far truly portable computers – ones that can be carried in a briefcase and be used anywhere on battery power – have generally shown their descent from programmable calculators. They have had limited computing power and user memory, but can be used easily on the move.

For greater computing power in a portable machine, users have gone to the Osborne 1. This is certainly a computer, and is portable in that it can be packed up and carried around. But it is heavy and bulky, weighing in at 26 pounds compared to the HP's 26 ounces, and does not have an internal battery supply.

There are truly portable and powerful computers around in the UK, for example the Husky from Coventry-based DVW Microelectronics and the much delayed NewBrain from Grundy Business Systems, but the HP75C will be the first such machine from a mainstream computer manufacturing company. If the big names are joining the game, perhaps there is something in it after all.

The Hewlett-Packard machine sits squarely in the gap between its programmable calculators, the HP41 series, and its low end desktop micros the HP86 and 87. Like the calculators it is battery powered, running off a rechargeable battery pack, but it uses the same custom-built CMOS microprocessor used in microcomputers and has a proper typewriter-style keyboard.

To conserve power it has an automatic shut off, but memory contents are maintained. It can be set to power up and beep at the user to act as a kind of electronic notebook, displaying messages on its single line display.

The standard HP75C comes with 16K of user RAM and 48K of ROM containing the proprietary operating system. Its instruction set is centred around Basic, and will remain so for the moment as there are no firm plans to extend the machine's capabilities to other programming languages, nor to move to other operating systems.

User RAM can be expanded by adding an 8K module, but the major route for extending the memory will be through plug-in ROM modules carrying application programs. Three 16K modules can be included at once.

Applications held in ROM modules will be aimed at business users as well as HP's traditional scientific and technical user base.

HP's first offerings will include specialised financial, investment and real estate modules, along with more general statistics and maths packages. Modules aimed at particular technical applications in electronic engineering will also appear. These ROM modules will complement "solution books" available at launch, containing programs on magnetic tape cassettes to be read in through a digital cassette drive.

Cyclists can now cross at this junction, safe from cars trying to turn left across their path.

Making roads safer for cyclists

CAMBRIDGE cyclists have won high technology help with the first separately signalled cycle lane in Britain. The cycling crowds can now cross the junction of Brooklands Avenue with Hills Road, safe from cars trying to turn left across their path – and it has all been made possible by microprocessors.

A Mitrac controller from Philips runs the signals, keeping the left-turn motorists away from the go-ahead cyclists.

The microprocessor-controlled system means that timings between the various phases and the order of these phases can be changed automatically, using information from vehicle and cycle detectors embedded in the road surface.

Traditional hard-wired traffic light systems would not have this flexibility, claims Philips.

Faster Z80 emulation

NATIONAL Semiconductor has brought out an in-system emulator for the 6 MHz Z80B microprocessor for use with its Starplex development systems. The package supports program development and single processor emulation.

In program development mode, users can develop and debug software for Z80B systems in real time, without needing prototype hardware connected to the development system.

In emulation mode the user's hardware provides the clock signal, allowing the whole Z80B ISE package to run at the actual clock speed of the prototype system.

The package includes the emulation board with all necessary cabling, complete software and a memory board carrying 32 Kbytes of high speed (55ns access time) memory.

8-bit boards in production

FRENCH semiconductor manufacturer Eurotechnique has gone into production with its 7000 family of microcomputer boards. The range uses the single Eurocard format.

The boards are run by a modular real time multi-tasking executive to simplify design of eight-bit systems and reduce software development costs.

DEC deal

LONDON-BASED Graffcom Systems has signed a five-year deal with Digital Equipment to supply its integrated small business software, ISBS, on DEC's range of personal computers.

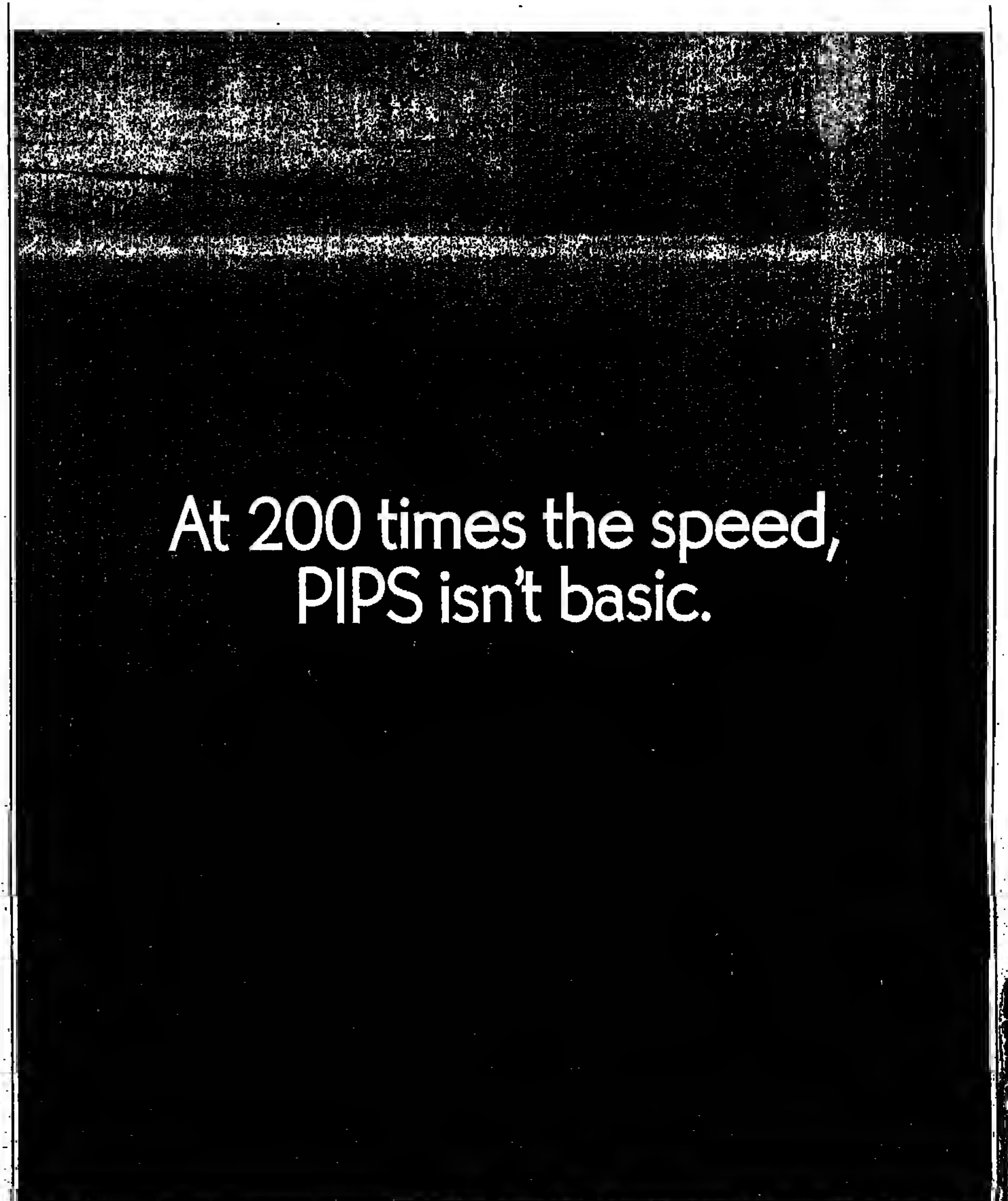
Floppy and hard disc version of the software run on eight-bit and 16-bit machines under CP/M or CP/M-86.

Commercial Superscript

SURREY-BASED software house Precision Software has packaged its Superscript word processing software for the commercial market. It will now run on existing Commodore microcomputer ranges and will be implemented on forthcoming machines.

More from Cynthia

CII-HONEYWELL Bull's Cynthia OEM division has extended its DBC-compatible memory subsystem to include PDP-11s. The basic Cynthia DSS1100 gives 20Mbytes of storage – 10 Mbytes fixed, 10 on a removable cartridge – which can be doubled by adding an extension box containing a second drive.



COMPANY NEWS

by Kevin Cahill

Lundy parent is recovering fast

RECOVERY at Lundy Electronics, the US parent of Lundy Farrington, continues apace with profits 41% up at $1.16 million compared with last year's $0.82 million. Turnover has risen to $28 million from $24.1 million.

Lundy Electronics went through a substantial reorganisation two years ago, which resulted in the introduction of new management and finance.

Prior to that the company, which held some of the original optical character recognition patents on which Farrington's and IBM's OCR machines were based, had a very indifferent record, with turnover and profits fluctuating from year to year, and little growth of any kind visible.

Lundy Electronics was also hampered by the fact that the bulk of the shares before reorganisation were held by the founder, making capital raising difficult.

At one point much of the company's revenues came from the UK where the management of the Farrington OCR company, bought by Lundy in the early Seventies, had established a major foothold in both banking and water supply.

Much of the input equipment used by the National Giro for its 600,000 daily transactions is also from Lundy Farrington, which is based in Portsmouth.

Earlier this year Lundy Farrington lost the maintenance contract at Giro when the Post Office brought in independent contractor DPCE. There were fears at the time that the rancour which developed between Giro and Lundy Farrington might jeopardise future business, but British Telecom recently ordered £350,000 worth of OCR equipment from Farrington for the input system to be used with its new operator connected call billing system.

According to UK managing director Adam Askew, UK business remains buoyant. New offices have opened in London and European expansion is organised from the UK.

Askew feels that Lundy has been successful in the UK with its traditional OCR product range, and that the new graphics terminal is making inroads into the manufacturing market.

ASKEW . . . "UK business is buoyant."

Irish Memory plans to grow at 50% a year

A TURNOVER of £50 million fuelled by annual growth of 50% per annum is the 1985 target for Irish computer vendor and manufacturer Memory Computers.

The company has just published figures showing an increase in turnover to £8 million for 1981-82 from the previous year's £5 million. Profits rose at a similar rate from £400,000 to £700,000.

The parent company, Memory Ireland, is one of the biggest Irish computer vendors, dealing principally in Prime equipment and a series of bureaux based on Prime machines. The Z80-based micros, the 7000 series and the 2000 series, produced by Memory Computers, are sold by both companies.

Graham Barrett, managing director of Memory's UK operation which currently contributes just over £2 million of the company's revenue, says that the eventual target is to have 50% of the company's sales originating in the UK.

Although based in Ireland, the company has increasingly sought its growth and opportunities elsewhere.

The UK is the fastest growing single market for the company's products, but Barrett points out that Memory Ireland has expanded rapidly overseas with two subsidiaries in Zimbabwe and substantial exports to several other African countries and to Australia.

In the UK the company has two bureaux, both based on Prime equipment and located in Central London. They offer a full set of batch bureau facilities, with on-line, real time, programming and systems design services.

Memory Computers was set up as a bureau in Ireland in 1974, and joined forces with Memory Ireland in 1980.

BARRETT . . . Looking for a higher proportion of growth in the UK.

CW SHARES TABLE

Date 25/8/82

Index 104.17

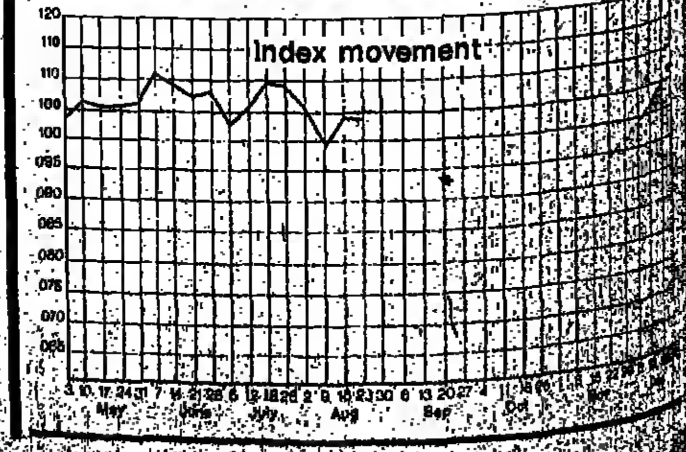
[illegible]

Pence 1982 High	Pence 1982 Low	London Stock Exchange Stock	Pence Price	C'nge
206	101	ACT (App Comp) (25p)	206	+ 5
186	150	BOC Intl (25p)	156	+ 4
31	16	B. Gov Kent (20p)	21	+ 1
127	101	Chubb (20p)	121	+ 3
94	48	Cole Group (25p)	84	
303	233	C.A.S.E. (20p)	267	+ 7
730	445	De La Rue (25p)	490	+ 6
360	225	Extel (25p)	325	–
445	312½	Ferranti (50p)	430	- 10
1094	787	GEC (25p)	1076	- 18
84	53	ICL (25p)	59	+ 2
47	30	Kalamazoo (10p)	30	- 2
310	273	Kode Int (25p)	273	- 3
310	216	Memec (10p)	310	- 6
174	110	Muirhead (25p)	177	- 2
284	218	N'market (1981) ($.05)	260	+ 3
820	670	Norsk Data	710	+ 25
390	288	Office & Elect (25p)	390	–
840	445	Philips Lamp (fl10)	623	- 6
828	348	Plessey (50p)	610	- 6
67	20	Quest Auto (10p)	27	–
620	363	Racal Elect (25p)	620	+ 2
750	171	Rediffusion (25p)	730	–
468	396	Thorn-EMI (25p)	443	+ 6
80	74	UCAT (50p)	67	+ 2
		OTHER MARKETS*		
80	80	Bus Comp (10p)	80	–
667	415	Comp Serv (£1)	451½	–
200	75	Consult (C&F) (10p)	200	–
168	160	Int'europe Tech (20p)	180	–
282	245	Io Tech (25p)	246	+ 1
80	48	Knight (5p)	66	+ 7
150	112	Miles 33 (10p)	140	- 7
170	86	NMW (£1)	98½	+ 3
104	48	Rolfe & Nolan (10p)	90	- 4
120	76	ScanData (10p)	106	- 6
258	180	Star Comp (10p)	258	+ 1
108	63	Trident Comp (10p)	63	–
112	78	Zygal Dyn (5p)	100	–

$ 1982 High	$ 1982 Low	US Stock Stock	$ Price	C'ge
20¾	18	Amdahl	[illegible]	[illegible]
70¾	11¼	Apple Inc	[illegible]	[illegible]
28	31	Auto Data Pro	[illegible]	[illegible]
37¼	30¼	Burroughs	[illegible]	[illegible]
13¼	7¾	Comp Auto	[illegible]	[illegible]
18	11¼	Comp Sciences	[illegible]	[illegible]
15½	11¼	Comshare	[illegible]	[illegible]
36½	22	Control Data	[illegible]	[illegible]
36¼	21½	Cray Research	[illegible]	[illegible]
63¼	20¾	Data General	[illegible]	[illegible]
40½	11¾	Datapoint	[illegible]	[illegible]
24½	10¼	Dataproducts	[illegible]	[illegible]
87½	63¼	Digital Equip	[illegible]	[illegible]
30¾	18¾	Elec Data Sys	[illegible]	[illegible]
6½	3½	Gen Automation	[illegible]	[illegible]
38¾	22	Harris	[illegible]	[illegible]
47¼	36¾	Hewlett-Packard	[illegible]	[illegible]
76	61½	Honeywell	[illegible]	[illegible]
33¼	20¾	Intel	[illegible]	[illegible]
65¼	67	IBM	[illegible]	[illegible]
66	36¼	Litton Ind	[illegible]	[illegible]
13½	8¾	MDS (Mohawk D)	[illegible]	[illegible]
24	15	MSA (Mgmt Sci)	[illegible]	[illegible]
18¼	7¾	Mngmt Assist	[illegible]	[illegible]
9¾	6¾	Modular	[illegible]	[illegible]
69	50¾	Motorola	[illegible]	[illegible]
34½	14	National Semi	[illegible]	[illegible]
66	40½	NCR	[illegible]	[illegible]
30¾	17¼	Perkin-Elmer	[illegible]	[illegible]
22¾	16¼	Prime	[illegible]	[illegible]
40	28¾	Raytheon	[illegible]	[illegible]
26¼	14	Signal	[illegible]	[illegible]
34	21	Sperry Corp	[illegible]	[illegible]
34½	10½	Storage Tech	[illegible]	[illegible]
29½	16¼	Tandem	[illegible]	[illegible]
36	23¼	Tandy	[illegible]	[illegible]
83¾	70¾	Texas Inst	[illegible]	[illegible]
27¼	12½	Tymshare	[illegible]	[illegible]
36¾	25½	Wang Lab B	[illegible]	[illegible]
10½	7½	Wyly	[illegible]	[illegible]

The table shows the closing prices in London on Wednesday and in America on Thursday. The [illegible] Index is based on the prices of the UK companies in the table. Highs and Lows [illegible] where necessary.

*Shares traded on the Unlisted Securities Market or under Rule 163(2)(a).



NEWS ANALYSIS

The NEB/CDC subsidiary is recovering from initial losses, says Kevin Cahill

Teething problems are over at UPL's Winsford plant

THERE are two impressive things about Winsford-based disc manufacturer United Peripherals Limited. The first is the fact that 550 people work there. The second is that the plant will deliver £28 million in product this year.

The size of the workforce is impressive because the factory in which UPL is based was an early victim of ICL's problems three years ago, and closed with the loss of over 1,000 jobs.

At the time there seemed little chance of any high technology company turning up to use a 350,000 sq ft facility in an area already plentifully littered with the vacant effects of the current recession.

But just as ICL was facing the downturn that nearly wrecked the company, the then National Enterprise Board via its subsidiary Data Recording Instruments had entered into an agreement with a subsidiary of Control Data Corp of the US to build disc-based memory products at Crewe, near Winsford.

The original agreement between CDC and DRI was based on a purpose-built factory at Crewe, but when the ICL factory came on the market United Peripherals moved there, writing off the £200,000 already spent on Crewe.

According to managing director Ed Dougherty, who took over the job of running the company less than a year ago, the factory is far too big.

"At the moment we have about 100,000 square feet of the facility blocked off behind a wall and we don't pay rates on it . . . yet." But UPL did get the factory at an estimated third of its full £18 million valuation.

However, the switch in factory site was not the only thing which happened to the new company.

When DRI wrote its agreement with CDC subsidiary MPI, CDC got a 24% stake in UPL, a service contract to manage the operation for DRI, and £8 million of equity from the NEB, which via DRI retained a 76% stake in the new venture.

Presumably the £8 million was meant to pay for the startup, but something went drastically wrong. Dougherty is understandably reluctant to say what happened prior to his arrival.

By the end of 1981, DRI as the financing partner had written off an estimated £20 million at UPL and driven itself into severe financing difficulties.

The British Technology Group, the successor to the NEB, this year restored the DRI balance sheet with a massive £12 million injection of cash. BTG officials admit that there was a very big overrun on the original costings.

The makeup of the losses, which has caused considerable confusion in various circles, has finally been documented by the BTG. Bank interest on the debts shot to £3.6 million over the period 1980-81 and the cost of reorganisation and stock write-offs totalled £12.1 million for the two years.

The other major cost appears to have been increased R&D expenditure at UPL of £2.7 million, again spread over the two years.

But Dougherty and DRI chairman Peter Gregory are quite sure the days of losses are over, at both companies. According to Dougherty the plant will this year ship over £28 million worth of product, including 500,000 printed circuit boards, to CDC companies in Portugal and Germany.

Gregory is completely frank about the process of privatisation, for which the £12 million balance sheet restructuring is meant to pave the way.

"I expect the privatisation of UPL to occur in about two years," he says, "and it was necessary to relieve DRI of its bank loans and overdrafts to pave the way for this."

BTG operations director Chris Birks reckons that a partial reduction in the BTG stake could take place within eighteen months.

Initially the percentage split between product deliveries was meant to be around 70% to CDC and its subsidiaries and 30% to DRI. But the rapid improvement in DRI's marketing position and what Dougherty calls "CDC getting its arms around the recession" has shifted the balance more towards a 50/50 split.

This is partly due to the fact that DRI is taking a much more aggressive marketing stance in both the UK and Europe, and is also restructuring its product lines to be able to offer a complete peripheral range, including a full slate of memory products as well as VDU and printer products.

With DRI an increasingly important buyer from UPL, the prediction by DRI's new marketing director Rod Saar of 20% growth next year augurs well for Winsford.

This year DRI achieved profitable turnover of £32 million, according to Saar. The principal products built by Dougherty at UPL are two CDC hard disc drives, the 14-inch Hawk and the Phoenix.

Currently Dougherty has a small design group working on what he calls the Windsor disc, an eight-inch fixed disc which will be marketed in the US by CDC as the Meadowlark. It is projected for delivery from Dougherty's plant at 960 tracks per inch, with a thin film head and a total capacity of 200 Mbytes.

Eventually, Dougherty thinks that the product will be a good seller, but wishes he had had it a year ago. "It's a very fast-moving industry — track densities and bit density have increased by seven orders of magnitude in the past ten years," Dougherty says, and adds that he sees no reason why this pace of development should not continue.

The pace of recruitment at Winsford has slowed, with Dougherty trading productivity for employment stability. He calls redundancies a "management cop-out" and obviously feels that good management can achieve a workable balance of plant utilisation by careful planning.

All in all, it now looks as if UPL has well and truly put its teething problems behind it and is set to make a major contribution as a UK-based disc manufacturing plant.

GREGORY . . . expects privatisation of the company in about two years.

he plant is expected to deliver £28 million in product this year.

HUMAN TOUCH

When the supplier goes bust...

Cliff Dilloway is an independent consultant specialising in accounting software, taxation and payroll.

PERHAPS the greatest concern on acquiring a software package is what happens if the supplier ceases to do business.

He may go out of business through simple financial failure or its opposite, the sell-out of a successful operation to a financial conglomerate. Either event is a disturbance of the rhythm of your supplier and decisions will start to be taken that are influenced more by the future of the business than the welfare of existing customers.

Rule One in all business is to be careful who you do business with. And this applies when acquiring software. The contract is important, but if you find you are looking at it two or three times a year to see what your rights are, then you have cause for concern.

Your concern will indeed rise if the supplier is not going to exist in the form that you have known. Try as you might to protect yourself in the contract, if the party you have contracted with is no longer in existence you are whistling in the dark.

No successor can be forced to assume the, obligations of his predecessors.

The word forced is the link. In what circumstances would a successor wish to assume the obligations of a predecessor? If the business desirability of assuming those obligations can be foreseen, then that desirability is a stronger bond than any contract.

The desirability arises from the anticipation of profitable business. The possibility of profitable business comes from either high charges or a large user base. Assuming you are not attracted by high charges, consider the security of the user base.

The business of maintaining a package with 100 users is good business. Even if the supplier goes bankrupt the receiver should sell the maintenance contracts of the software to a reputable company for a respectable sum and meet his obligation to raise as much from the assets as possible.

I express no opinion on how many users are necessary to make the asset worth selling, but would suggest that you back your judgment and take into account the sales that will be made following your purchase.

After all, it may be those sales that cause the stronger looking competitor to go out of business.

Cliff Dilloway

SYSTEMS THOUGHTS

The way disc storage should be going

Owen Hanson is head of the Ce for Business Systems Analysis at City University, London. He is a consultant to a number of co panies, including IBM.

LAST year was one of shortage in the disc storage market. Delays in the supply of IBM's big new 3380 disc, and temporary problems in the manufacture of 3370s in Europe, meant that many users had to wait for these devices.

This had two consequences. First, suppliers of double density versions of the 3350 had a very good year. CDC's 33502, STC's 8650 and Memorex's 3652 were sold as fast as they could be supplied. Second, the price of used 3350s reached as high as 130% of their new cost.

All that is over now. IBM is selling 3350s at a lower price than before, and used units fetch about 70% of new price at best. Even so, 3380s are still not readily available, although it looks as if they soon will be.

Problems with the availability of disc storage have diverted attention from an issue that is likely to have a strong impact on all users in the next few years. It is that double density 3350s, 3380s and the double and even quadruple-density versions of the 3380 that we can expect to see in the next few years, all reflect the same pattern. The amount of data that is serviced by a single access mechanism continues to increase.

If increased data capacity per access mechanism had been balanced by increased access speed, there might have been no problem. It hasn't. Since the early Seventies we have seen the following:

3330: 100 Mbytes capacity per access mechanism; 800K bps data transfer rate; 38 milliseconds average access time.

3380: 630 Mbytes capacity per access mechanism; 3M bps data transfer rate; 24 milliseconds average access time.

(The average access figures here include eight milliseconds for rotational delay, and assume that the whole disc is being accessed).

The figures show that, while capacity has increased over sixfold in a decade, access speeds have hardly increased by a third.

The usual defence of this is to point to the fact that much more data is available without head movement, or with only a small movement. This is true, as one cylinder of a 3380 holds 712 Kbytes at maximum while one cylinder of a 3330 can only hold 247 Kbytes. However, this has its main effect when there is no head contention. Users will not need to be reminded that a page data set is best stored on a dedicated disc – it may well be a sore point with them. Even in normal multi-programming operation, head contention is unavoidable on occasions.

Larger disc capacities make it more likely in two ways. First, more files are held on each disc. Second, fewer separate discs are available in a given installation.

Whatever disc manufacturers *say*, the things that they *do* show that they are now aware of the problem. On its double density 3350 equivalent, the 8650, STC has provided both the cylinder interleaving and back-to-back mapping options. In the first, the device is handled as two disc volumes made up of alternate cylinders and serviced by separate access mechanisms.

In the second, the device is handled as two separate volumes made up of the inner and outer sets of tracks. To guide users on the best placement of files, STC provides the disc dataset characteristics program.

Memorex pioneered another improvement, with its disc cache. However, like many other pioneers, it ran into problems. The technical snags were put right, but the device was designed for use with 3330s or their equivalents, and was finally withdrawn.

However, the introduction of 3880 storage control units containing cache – the 3880-11 and 3880-13 – and of sybercache by STC, shows that Memorex's idea was a winner.

In addition to these "front end" enhancements to disc performance, there are also some solid state discs on offer. STC provides the 4305, which has a capacity of up to 45 Mbytes, and an access time around eight times faster than the best fixed-head disc. Intel offers the 3805, with a capacity up to 72 Mbytes, and the ability to simulate a 3350 as well as a 2305 fixed-head disc. The access time is similar to that of the 4305.

For the moment, these devices are mainly of assistance for the page data sets, indexes and the frequently used data. Over a period, they may replace discs due to their much better access time.

The very large IBM, Hitachi and NAS mainframes were reported, earlier this year, as disappointing in performance. This was not due to hardware speed, which was said to be better than planned. It was due to the channels.

Disc manufacturers – and principally IBM – could, and in my view should, have gone for fast access small discs, each on separate channels. I believe large volume discs can only be made efficient by very careful system design, and the use of enhancements such as cache. Small discs would have solved most of the problems automatically.

Owen Hanson

FOCUS

Day of the consultant

WITH company computing power and responsibility moving out of the hands of the DP team, opportunity doors are being opened for industry consultants and advisers to move in. In many cases they are not so much moving in as being pulled in by user management.

Enlightened management recognise that their own in-house skills and talents could not handle the introduction of a LAN, electronic mail or publishing system, especially as suppliers of such services do not provide an installation implementation guide manual. In many cases they do not provide a product. Even the high street micro superstores cannot sell an off-the-shelf company work processing system or distributed PoS.

There is no way a potential user can buy a do-it-yourself kit assembly of cut-out microchip boards for that electronic mail requirement, even if the organisation already has suitable terminals, networking and supportive mainframe.

Similarly, the introduction of office automation or the office of the future technology needs more than an adequate balance sheet and fond hopes.

It is at this point that users are discovering that consultants can offer a cost-effective service. In many cases, it can be cheaper for the company to use the services of a consultant rather than a company employee. A consultant is under contract to deliver the goods both from the point of view of timescales and quality.

By concentrating on selective areas of technology, consultants can offer expertise and experience. Unlike the company DPM, the consultant is independent to undertake a major examination of company processing requirements now and in the future.

Although the authorities do not widely promote the fact, the government is behind the resurgence of UK consultancies. Under the aegis of IT Year 82, the Department of Industry, the NCC and British Telecom, large public funds have been made available by UK and European authorities to support information technology development.

Government support is to be welcomed if the UK is to compete effectively with the remainder of Europe and the US. By concentrating on future areas of technology, UK industry will benefit, hopefully ahead of the international field.

The days when the consultant was seen as the management representative, put in to supervise and possibly control company DP operations is, fortunately, long past. At that time it appeared that the role of the consultant was to spread heavy layers of doubt and confusion across the computer operation. The more problems created, the more chance that the consultancy team would be retained by the company.

Now the role of the consultant is more than that of working along with or advising the DP team or user management. The consultant is expected to know his way round British Telecom, IBM and the computer industry.

Such is the current demand for consultants that many companies are recruiting additional personnel, offering the promise of good pay scales, job satisfaction, much travel and responsibility.

But rather like getting into computing, getting into a consultancy job is not easy – unless that is, you are already in the industry. First-time employees are discouraged and only those with qualifications need apply.

Not so long ago, the ambition of every consultant was to move into DP management, join the IDPM and company pension schemes and settle down to a stable existence.

This is no longer the case. Most DPMs would be only too happy to join a consultancy team or systems house and take part in the great technology stakes.

The future is certainly greener outside the installation doors.

Alan Simpson

DOWNTIME

Doling out praise

WHEN politicians aren't kissing babies, either real or metaphorical, they are in great demand to add credence and weight to opening ceremonies. No supermarket or multi-storey car park can be inaugurated without a sizeable press presence, and the appearance of an MP goes quite a long way towards attracting hacks.

The task for the politician is relatively simple: smile a lot, call the managing director by his Christian name, and utter a copious quantity of platitudes concerning the wonders of the supermarket/multi-storey car park/computer building in question.

And so it was that Jim Hamilton, MP for Bothwell, was invited to say a few words at the grand opening of Honeywell's new Glasgow sales office. The smiling faces of the Honeywell hierarchy reflected the corporate confidence in their new office.

"It's a good to see a company investing in these times of high unemployment," said Hamilton.

The Honeywell smiles grew ever broader. But they rapidly changed from confident to nervous as Hamilton uttered his parting shot: "Lets hope they again employ the 5,000 people they once did in my constituency."

Oops.

Corporate heart of gold

IBM-WATCHERS and pundits around the world were caught on the hop this week, when the latest product of IBM's multi-billion dollar research budget was proclaimed to the world.

No, not the Josephson-junction supercomputer; not another 3083; not even something to make the 3380 disc drive actually work, though that's getting warm.

It is, and I quote, "a new safe and cost-effective chromium plating technology".

Chromium-plating? Is IBM at last diversifying from computers to take over the world?

No, it's simply that in the process of research into disc drive coatings at Hursley, IBM discovered a method of chromium plating which is less likely to kill off the workers than traditional methods (or, to quote IBM, more "ecologically acceptable").

Being a public-spirited organisation devoted exclusively to the improvement of Man's Estate, IBM immediately looked around for a way of making money out of it. The outcome was a deal with a conning company possessing the scintillating name of W. Canning PLC, by which the two firms jointly developed the process to the stage where W Canning can market it.

We always said IBM had a heart of gold.

EVERY week advertisers buffet us with photographs of bits of hardware in the hope that we will spare a little space in our battle-hardened columns. Here we have one such photograph of a new wizard keyboard that is supposed to have us all doubling our rate of data entry. It does, in fact, look rather an interesting keyboard – what little we can see of it through the hands of its operator that is. I know the latest trend in marketing is not to name the product being advertised, but not letting us see it is a new game.

A moustache worth £25,000

CELEBRITIES with distinctive features stand to make a lot of money from advertising – witness Henry Cooper, whose unmistakeable bald head is still worth a bob or two on the box.

Actor John Dixon has just signed a two-year contract with Canon UK to pose with the company's new microcomputer range. The contract is worth £25,000 – with just one string attached, Dixon's moustache.

If he shaves it off the contract is null, not to mention void.

The games they play

AS with poems, philosophers and saints, each good computer game generates scores of inferior copies. But when these copies are cheaper, makers of of the originals ask themselves: can we sue for breach of copyright?

Lawyers representing computer game giant Atari threatened to do just this with Bug-Byte, whose game Vic-Men they claimed bore an uncanny resemblance to Atari's own Pac-Man.

Bug-Byte has now come to a gentleman's agreement with Atari. It withdraws Vic-Men and Atari withdraws threat of legal action.

Besides Bug-Byte sales manager Mark Butler admits his company did copy Vic-Men from Atari. "But when we brought it out we got on to Atari," he says. "They gave us two options. Either we don't do it, or we do it and don't tell them."

Bug-Byte took the latter course and Atari didn't like it. Then came the threat of legal action – [illegible] below the belt, felt Bug-Byte.

Butler is rather hurt by all this. Why should Atari have the field to itself when it has already made thousands from the product, he argues. "You can't copyright an idea."

Maybe not. But you can't [illegible] one either, unless you give it a new suit of clothes. Bug-Byte is now doing precisely that to its Vic-Men before a possible release.

Pain in the...

THE computer industry's diet of acronyms is usually as indigestible as a school dinner, but from time to time I come across an item of roughage that really gets my brain going.

One such is GTE's programmable Modem given the [illegible] AN/USQ-83, which is [illegible] good as the acronym ARSE [illegible] to an East German seat [illegible] system for railways.

I have always thought the mouth of the computer industry [illegible] in its backside.

ComputerWeekly

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Thursday, September 2, 1982

Sir George in Wonderland

THE days before the August Bank Holiday are not generally the ones in which anyone expects a tour de force by any large company, particularly not from a nationalised one. But at the end of last month British Telecom produced a dazzling display of pyrotechnics, starting with the launch of some new, innovative and useful services and winding up with the announcement of last year's profit.

This was an adequate finale to a set-piece show – profits had rocketed to £458 million from £124 million last year.

This should be good news in the long term for anyone using telecommunications, for it means that Telecom will have enough cash in the kitty to develop badly needed services and overhaul Britain's telephone system which can be described, charitably, as creaking at the seams.

And it certainly should be good news for British Telecom. One would expect the head of any company that had almost quadrupled profits and, in this case, more than met the stringent financial targets set by its owners – the public represented by the government – to start ordering jumpers of Champagne all round.

But not so Sir George Jefferson. With the aid of some quick number-shuffling, he assured us that although it might look to the uninitiated as though his company's turnover had made a jump of a quarter or 25%, this really turned out to be only a modest increase of one twentieth, or 5.6%.

"Curiouser and curiouser" as Alice said – and it is worth remembering that she was the invention of a mathematician.

For according to Sir George the real way of looking at things is to disregard any extra revenue brought in by price increases. Only thus can the true picture be formed of British Telecom's position. Hence the "net overall growth in real terms of approximately 5.6%."

Swallowing an innate propensity to doubt anyone who gives approximate figures to one decimal point, we feel that this imaginative statement demands further examination. And it is worth pointing out at the beginning that Sir George bears only a small part of the blame for having to stretch our ordinary concepts of basic arithmetic.

For he, and British Telecom, find themselves in a true wonderland. On the one hand the corporation is supposed to act in the same way as any normal large company, subject to the restraints of various Acts of Parliament and the accepted practices of the accounting profession. And while it is true that there are many ways of preparing accounts – as investors in various Canadian Arctic gold mines may know to their cost – the vast majority of annual accounts do present a true and fair view of the financial state of the company.

But British Telecom is also subject to the arcane financial rules of the Treasury. It only escaped from direct Treasury supervision in the late 1960s. There other rules apply. It was only a few years before the invention of the typewriter that the Exchequer, as it then was, gave up the preparation of its own accounts on notched sticks.

Public accounting is swayed by political necessity, as is British Telecom itself.

It is impolitic for the corporation's management to mention it, but much of the responsibility for the archaic state of most of British Telecom's network can be laid at the doors of successive governments since 1945, if not before. It was always easy to cut investment in telecommunications when the country's finances hit a rough patch, and few Cabinets resisted the temptation.

In addition to these traditional interferences, Sir George has to contend with the government's announced plans to sell off all, or a great part, of Telecom, a prospect which has united the Telecom unions in opposition – a remarkable achievement in itself.

These facts go a long way to explain why Sir George is attempting to play down his company's gains. But his effort should not divert us from the fact that it is a very real achievement and offers the only hope in Information Technology Year that our telecommunications network will be substantially improved in the near future.

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by G. Green of Lincoln, who wins £5.

You have to be an international executive and preferably one in computer programming, to appreciate the wealth of technical information about the hotels, restaurants and sights of interest.

Lincoln Choice

LETTERS

Grants for exporters

IN his article "Not-so-green isle sets up DP jobs for UK" (CW, August 12) Philip Hunter implies that UK and other foreign companies establishing software operations in Ireland are forced to export their product due to a depressed home market.

It is widely known that the majority of foreign companies in Ireland receive grants from the Irish Industrial Development Authority which are primarily given to companies which export from Ireland: no grants are given to overseas companies looking to compete with local firms on the Irish market.

It is therefore unlikely that UK companies will be disappointed by the home market: it is not the reason for their presence in Ireland.

Hunter is also somewhat confused by Ireland's tax structure: to set the record straight, all manufacturing industry and software development in Ireland pay a maximum corporation tax of 10% until the end of this century. This is applicable both to Irish and overseas companies.

DAVID O'DONOVAN
Director, Great Britain
IDA,
London W1.

Printing slip

I SHOULD have thought someone as fanatical as Chad about his Irish/Scottish ancestry would be rather more meticulous than to mistakenly attribute fine inventions to the English (CW, August 12). Printing, alas, was the brainchild of Gutenburg, a German. Caxton nicked the idea from him, to the chagrin ever since of our Teutonic cousins.

I don't mind – I enjoy basking in the mistaken glory; but one should put the record straight.

PAUL FREEMAN
Electrical Times,
Sutton.

Status of computing

I CANNOT agree with Dr Allan in attributing blame for the reclarification of computing as a non-laboratory subject to academic computer scientists (CW, July 29). Whatever the status of computer science, there is no doubt that physics is, in many ways, a mathematical science, yet nobody would dream of regarding it as a non-laboratory subject.

Even theoretical physicists need a basic training in experimental science, just as the most practical experimenter needs mathematical formulations. Chemical electromagnetism did not completely leave the laboratory when Maxwell formulated his equations.

Then explaining the mathematical nature of parts of computing does not imply that it should be treated as a non-laboratory subject. I am sure Dr Allan does not wish to imply that one should suppress one's results and views, for fear that some bureaucrat might distort it into an excuse for doing wrong.

With regard to the particular matter he mentions, structured programming and program verification were developed in response to the problems of ensuring that programs would produce the correct results. As a sociologist Dr Allan might like to investigate why management is so often satisfied with the use of unreliable methods. Certainly one hopes that concern with getting correct results is no passing fad.

As to the use of abstract and physical machines, the use of abstract machines, which can then be mapped on to physical machines, considerably aids portability – see, for example, much current work on computer graphics. Also it is vital that students learn principles rather than quirks of the system. Thus Thames Polytechnic sandwich students are able, during industrial training, to be fully useful members of computer departments, even when using strange machines and strange languages. This is not academic theorising, it is the opinion of hard-headed commercial managers.

J. A. T. MADDISON
School of Maths, Stats and Computing,
Thames Polytechnic,
London SE18.

Interference safeguards

ONCE again the lack of comprehension by design engineers and system designers of the effects of Radio Frequency Interference (RFI) and electro-magnetic Compatibility (EMC) is demonstrated ("HP minis run into radio interference," CW, July 29).

While it is true that screening the room should solve the problem, a full site survey should have been carried out to determine the levels of RFI before the system was installed. In addition the disc drives should have been provided with adequate self screening during the design stage. HP equipment is among the best in the world, but nevertheless its general level of screening is no better than the minimum required standards.

Although HP (UK) may not have encountered as yet any similar problems, CB radios with illegally high powered transmitters, and the increasing use of micros with high clock frequencies, are growing and these will undoubtedly cause similar problems to occur in the more populous areas of the country and in many areas of industry.

RFI/EMC testing of equipment is not cheap, but without it, and site surveys before installation, no guarantee can be made for the proper operation of computer systems in any given environment.

G. STANFORTH
Bury.

Don't panic in the office!

MARTYN HARRIS' article, (CW, August 12) "Office Systems put users in a panic", rightly pointed out that a number of vendors such as IBM, Xerox and OTL offer systems with fully integrated hardware and software. He also suggested that these systems provide the best solution to the user's needs – apart from price, for which he quoted a "modest Prime system" costing over £100,000.

With a starting point of £100,000 I would have to admit that users would face an overwhelming problem of initial cost justification, but there really is no need for panic.

OTL's Information Mangement Processor range (Imp for short) starts with an entry-level system for £15,600 and this can be gradually upgraded in the field without redundancy of hardware to a large configuration of 32 workstations, sharing say 12 printers and 32 Mbytes of online storage, at a total cost of about £180,000.

This configuration can be upgraded even further by adding more printers or online storage, or by incorporating Imp's unique voice annotation and messaging facilities, or indeed by networking it with other systems.

I hope that anyone with a need for integrated but inexpensive and upgradable electronic office systems will contact me at OTL Winchester rather than panic.

R. J. TAYLOR
Office Technology
Winchester.

Post haste

REGARDING your Downtime item (CW, August 5) concerning the prompt arrival at your offices of a letter bearing no more than some initials and a post code, at about the same time as they achieved this feat, the Post Office took 12 days to deliver a letter from Hull to my home, even though it was clearly and fully addressed and bore the correct post code.

COLIN HICKS
Batley.

High technology centre

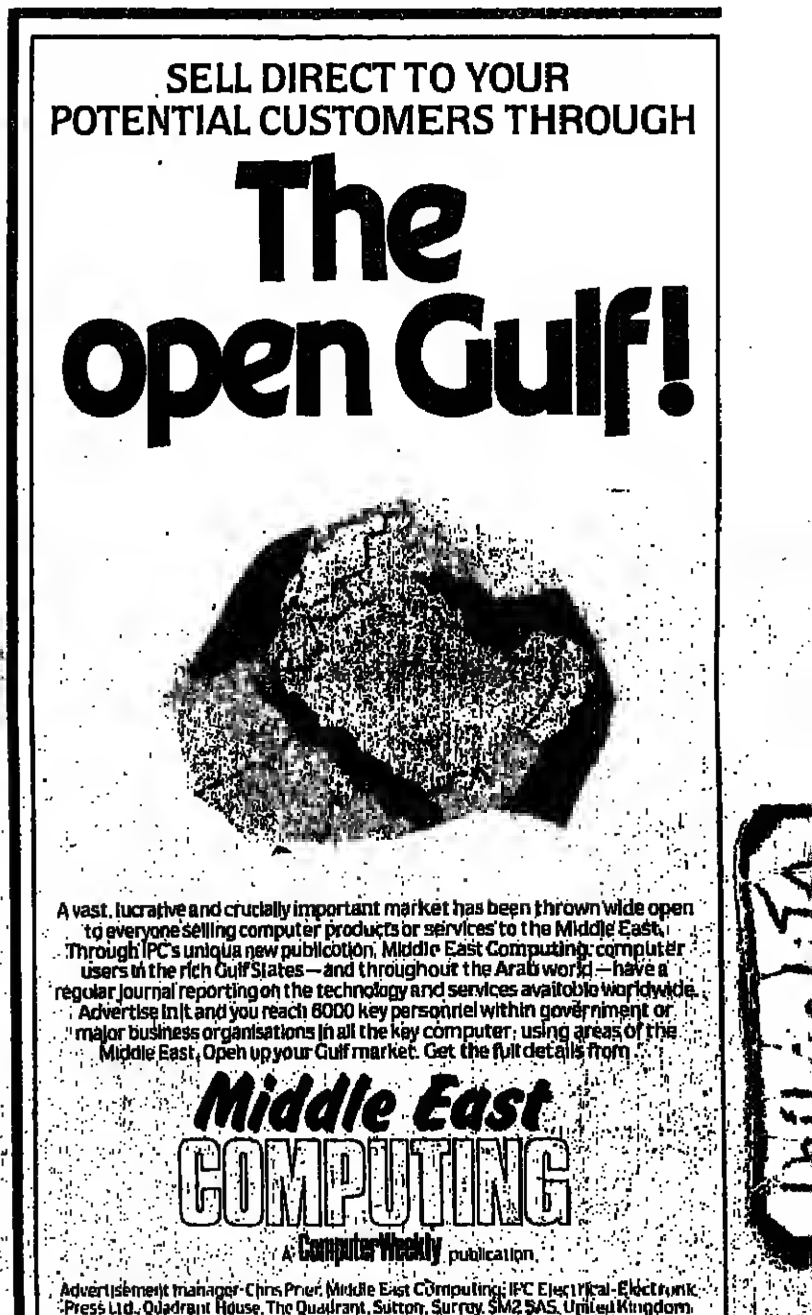
I READ with interest your recent articles on Property and Technology – the Needs of Modern Industry, based on the survey carried out by Herring, Son and Daw. However, having obtained the report, I was concerned to read the reference to Stevenage in the sector on new and expanded towns.

Stevenage, despite being "designed in the traditions of the last two decades" is already a centre for high technology industries with a number of major employers in these fields. In 1980 there were 1,890 jobs in electrical engineering and 7,500 jobs in aerospace (27% of total employment in Stevenage).

This potential for growth has been recognised by the Borough Council who have allocated a number of sites for future industrial development in the high technology category. Two such sites, Old Knebworth Lane and Meadway, extend to 50 acres and 16 acres respectively.

I am therefore, surprised, indeed perturbed to read in your report that Stevenage, in common with most other new towns, has little scope for major high technology industries. Stevenage has a growing high technology sector, it already has co-axial cabling in virtually all residential premises with the potential for the extension of this system to new industrial and office premises; a satellite system is currently under discussion.

R. F. WILSON
Director of Technical Services
Stevenage Borough Council.



PROGRAMMERS PAGE

by Philip Hunter

Business is booming in image analysis

Michael Szczygiel, Pactel consultant and video disc specialist, discusses image processing

THE full power of data processing is now being applied to the realm of images.

The implications for printing, publishing, advertising, graphic arts, office systems and libraries are profound. Dependence on paper or film as a prime means of communicating information with "pictorial" content will become less and less, and where paper continues to be needed the process of producing presswork copy will be greatly simplified.

Furthermore, with image processing techniques there is the opportunity to enhance management information systems with respect to visual content and quality, provide mass verification of signatures for banking applications and provide "intelligent" vision for industrial robots.

The concept of processing pictures by computer was formulated by information scientists in the 1960s. The aim was to provide a means by which the content of a picture, not readily seen by the human eye, could be clarified by general picture enhancement or selective extractions of key features.

With major funding coming from military, aerospace and medical research programmes, digital image processing has grown apace and has resulted in the development of much new hardware and software for image handling, analysis and recording.

Notable examples of digital image processing are:

- Satellite reconnaissance. Video pictures of cloud-covered or forest-covered terrain can be analysed to show the outlines of underlying man-made features. Clear-sky images of the earth can be analysed to show underlying geological features suggesting mineral deposits.
- NASA Voyager. Image processing has been used to enhance video pictures of Saturn, providing far more data about the structure and chemical composition of its surface and rings than would be available from a human interpretation alone.
- Medicine. Computer-assisted tomography was devised to scan the human body and highlight areas of diseased tissue not readily detectable by other means.

The development of hardware and software inspired by digital image processing is now leading to a number of important commercial applications.

In the picture-coded format, the basic information element is called the pixel (picture element), a square cell. An A4 page would typically consist of 2,200 rows of such pixels, bringing the total number per page to nearly four million.

Associated with each pixel is a code defining its level of shading, pure black or white or one of 254 levels of grey. (The human eye can distinguish up to 40 shades of grey.) Colour follows a similar but more elaborate coding scheme.

At this degree of resolution the resultant image quality far exceeds that of a standard TV screen and approaches that of conventional press lithography (see figure).

Under program control, passive background areas can be stripped out by removing the associated "white" pixels. Thus only those areas of the picture containing live information need to be stored in pixel format. This increases the efficiency of storage and transmission by factors of up to 10 for drawings and artwork.

For the efficient storage of masses of pictures either in coded pixel format or standard TV signal format the optical video disc is emerging as the front runner.

Typically on a 12-inch disc 10,000 to 25,000 A4 size page images can be recorded. In the future this will allow major reference documents, such as encyclopaedias, to be issued like LP records with similar production costs.

The disc is indexed to allow high-speed random access retrieval of pages. It can can be used either like a book or as a more sophisticated database search/retrieval system.

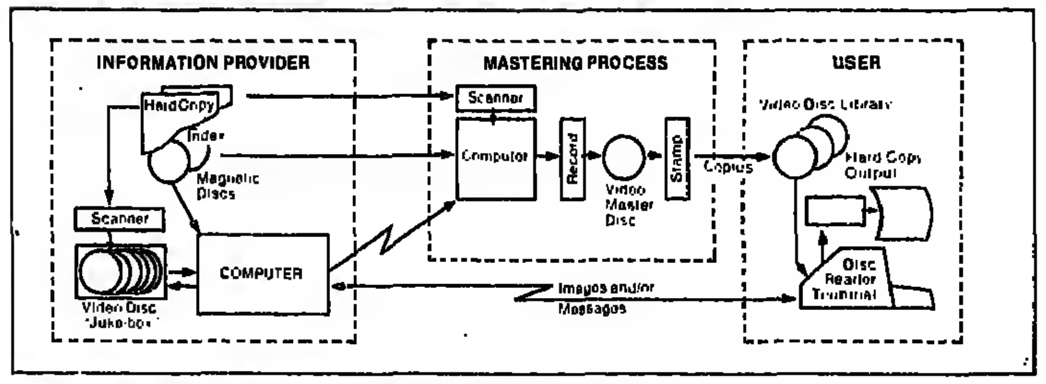


Figure 1. Images can be made available to the end user either via online access to a central "juke-box" archive or via a mastering process which produces duplicates of disc files.

There are a number of interesting examples of what can be done with video discs.

Sears, the large US department store chain, is running a pilot video catalogue for use by customers.

The publishing house Pergamon has implemented a patent reference system with online text retrieval, supported by eight video discs on which are recorded all relevant drawings and sketches.

General Motors in the US has ordered several thousand Discovision players for installation at its dealers. Promotional material for customers will be recorded on one set of discs and training materials for salesmen on another set.

Hughes Aircraft has put the complete maintenance manual of a weapons system, a six-foot high stack of documents, on to a single disc.

For office systems or library archiving applications the system can act like a photocopier – paper documents are recorded directly on disc by clerical staff. Once recorded and suitably indexed, individual discs, instead of being replicated in quantity become part of a mass store filing system.

The development of such a system has been announced by Philips. Within Megadoc typed and handwritten documents can be stored within one second on a digital optical recording disc using a laser.

At a command from the clerical operator, the information can subsequently be transferred into the archive, a "juke-box" containing 64 DOR discs, which takes up the same floor space as a normal office desk.

A single juke-box has a storage capacity of approximately 1.5 million A4 pages. In a conventional archive, this would require a row of cabinets 60m long, 2.8m high.

Each stored document can be traced within five seconds and reproduced on a screen which displays every detail of the document in black and white.

Documents can be retrieved from the juke-box using terminals located either in the same office block or several thousand miles away. For those documents in frequent use by a geographically dispersed group of many users, discs can be duplicated via a "mastering" process.

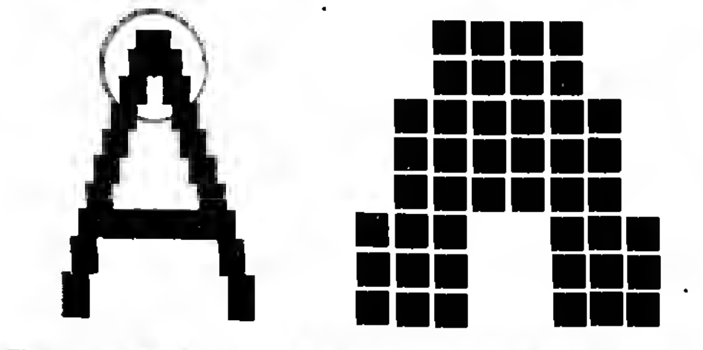


Figure 2. The letter "A" viewed as a configuration of pixels under a magnifying lens.

The meaning of truth

TECHNICAL writers are perpetually caught between two sometimes conflicting aims – the need to be accurate and the desire to explain things clearly and simply.

Sometimes truth has to be compromised in the interests of clarity, while conversely simplicity may have to complicate with matters of fact.

Programmers have developed their own jargon whose purpose is simply to communicate accurately in as few words as possible. Therefore we have words like baud, byte, bit, buffer, bug, bus and boot, all of which are succinct terms for what they represent, but meaningless to the layman.

The problem comes when the programmer has to communicate with a client, or explain something to a friend. In that case, it does little good to say something such as: "There are only 107 bytes of RAM left."

Instead you must say: "There is room for about 100 characters."

Notice that the second version is not actually true. But it gets across. And after all, half a truth is better than no truth at all.

Even Jesus Christ, when asked what truth was by Pontius Pilate, was unable to answer.

PUZZLER

WITH acknowledgments to the Bard, allow me to present our first ever Shakespearean alphametic, culled from Macbeth, Act 4, Scene 1.

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DOUBLE
DOUBLE
  TOIL+
-------
TROUBLE
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See page 47 for the actual addition sum.

OP SPOT

by Andrew Thom

Ops training that even the user understands

WHAT does training mean to you? Chances are it involves being left alone in an empty office with a pile of manuals for several days. When you are finally let out you will be trained to the peak of perfection and highly motivated.

As John Wayne would have said: "The hell you will".

Considering the white heat of technology surrounding the computer industry, it is surprising and alarming to discover just how outdated DP training at most companies is. And for operators, training is more vital than for any other area of DP.

What does it matter if a programmer makes errors during the course of his work? Unless the department is stupid enough to permit testing on live data, it is of little significance if mistakes are made. A badly-trained operator, on the other hand, can wreak all manner of havoc and destruction with a single mistake.

The fundamental difference between the two jobs is that, although the theory part of training is much the same, the hands-on experience for an operator exposes him to the real world while the programmer can hide behind a user-friendly compiler and operating system.

Traditionally, practical training for operators has been left in the hands of an experienced shift leader or senior operator. This is all very well if the installation has sufficient staff levels to prevent a constant stream of interruptions to the instruction, but such sites are the exception rather than the rule.

If there were a simulator which could run as a job on your machine, the trainee operator could be placed in front of a terminal and presented with an exact representation of the live working environment. Any mistakes which could mean death to the system should they be perpetrated on the main console would be rendered harmless.

Good old IBM has a computer-based training system called IIS (Interactive Instruction System) which can do just this. But — and it's a big but — IIS hardly falls into the user-friendly category.

Assembler is bad enough, but IIS beats it hands down.

IIS experts can be found, but even the most competent can only work so fast. With several courses to be developed for each department in the company, the time from course specification to completion is measured in months rather than weeks.

Your IIS expert will usually be from a systems programming background. He will not usually be au fait with the niceties of operating, and the shift leader or ops manager briefing him on the course requirements will almost certainly have little idea of the structuring of the course.

Thus we find a communication failure which can lead to the finished course bearing little resemblance to what the operations department had in mind.

It typically takes 100-250 man hours of coding to produce one hour of computer-based training using IIS, but help is at hand in the form of Dialog. McGraw-Hill International Training Systems has just introduced to the UK a piece of software developed in Germany which fits neatly between IIS and the user.

Put simply, Dialog translates high-level instructions from the person developing a new course into the low-level IIS code. And that person can now be a shift leader or ops manager. Even users can understand it.

Jim Mooney, product manager for Dialog at McGraw-Hill, claims that a two day workshop is sufficient to allow someone to start developing courses on their own.

"If they can use an editor, they can use Dialog," says Mooney. "All the author needs to know is the name of the course. Dialog takes care of the housekeeping."

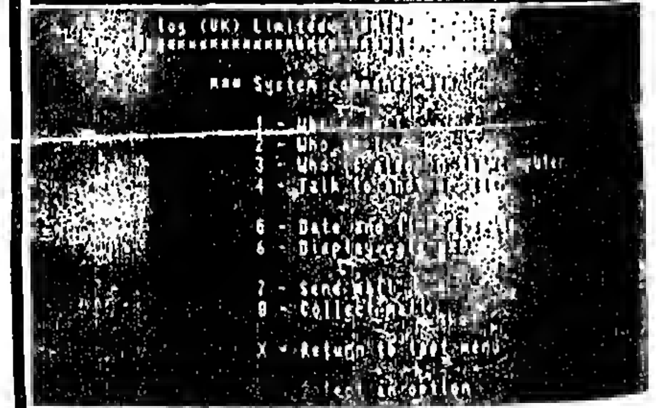
To set up a console operating course, it is a simple matter to copy the installation's syslogs into a Dialog library from where they can be used as screen formats. A new operator, fresh off the streets, can be let loose on an exact copy of the production workload and can make as many mistakes as he likes without causing the wrath of the users to fall upon the operators.

Three Dialog courses can be run for the same CPU overheads [illegible] interactive user, which is a [illegible] price to pay for the costly [illegible] it can prevent. A licence for the [illegible] will cost you £13,600, or [illegible] for a commercial licence if you wish to develop courses for sale to third parties. You'll need to get a copy of IIS from IBM.

And you could make a little money on the side. "If people want to develop general courses and market them," says Mooney, "I have lots of blank pages in the catalogue."

I have to admit to being [illegible] impressed with the educational material produced by Dialog. Why, I could almost [illegible] teaching myself CICS with it.

Wake up at the back! Has this type of computer training had its day?



A glaring example of the most common VDU ailment.

Spray away glare from screens

LET US reflect for a moment on one of the major bugbears of using a VDU: reflections. Not only does the glass of the device reflect the operator's image, the windows behind him and the light fittings, causing eyestrain, but any attempt to make the displayed data clearer by increasing the brightness usually results in a reduced tube life.

So, what can be done? Well, you can stick coloured plastic on the screen in an attempt to increase the contrast of the image, but such measures are largely ineffective. But there is now a product on the market which really does substantially reduce reflections.

Tele-Spray AGM is a Swiss material which is sprayed on to the screen. After drying, it is polished to obtain a smooth surface which reduces reflections and glare by a claimed 90% while only causing a 10% degradation of the character [illegible].

One coating is usually sufficient but further applications will result in reflections being reduced even further, though at the cost of some blurring of the image. The coating also possesses anti-static properties, and can be written on with a ballpoint pen.

The coating can be cleaned with a special polish, and is guaranteed for five years if this polish is used exclusively. This period is the effective life of a VDU tube, so represents a lifetime guarantee.

Siemens and Grundig are [illegible] factory coating their VDUs, and the cost per screen is £18 with reductions for quantity. I have seen the stuff in use, and can assure you that it works.

But don't take my word for it; get one of your terminals treated and see for yourselves. Contact Derek Davidson on 0532-[illegible]

Goodbye to all that

WELL, this is it old chums, the end of the line. The last Op Spot ever.

Come on, Jones Minor, pull yourself together, it's not all that bad.

But why? I hear you ask.

Next week sees the birth of the eagerly-awaited new feature page, Workplace. Well, you would have been eagerly awaiting it had you known it was coming. No more will operators and programmers glare at each other from facing pages of Computer Weekly. No more will operators be able to tear out Op Spot and throw the rest of CW into the bin.

You're going to [illegible] with programmers [illegible].

Yes, the very [illegible] operator page is [illegible] that appalling [illegible] bring you a [illegible] view of [illegible] in Computer [illegible].

So put away those [illegible] kerchiefs, straighten your caps, stop slouching. You're [illegible] to have to start talking to programmers. I know it won't be easy, but make the effort [illegible]

PEOPLE

Managing director named at X-Data

X-DATA, part of Technitron International, has named Andrew Montgomery managing director. He will also continue his group responsibility for DP marketing in the UK and Western Europe within Technitron. He replaces Peter Haworth, who is staying in the Dyneer group (which owns Technitron). Haworth will continue to act as a member of the X-Data board.

Montgomery worked for ICL for 13 years before joining Technitron. His most recent position was general manager for East Europe and dealer operations. Before joining ICL he was in operational research with the Co-operative Wholesale Society in Manchester.

X-data is an equipment wholesaler whose market is with technically self-sufficient users, suppliers and dealers. It was acquired by Technitron International in October last year.

Carrick and Martin show their certificates, which were presented by ITT-IDEC director Peter Cropper (centre).

Software prize

ITT-IDEC has awarded its Ian Blackhurst Memorial Prize to programmer Tricia Carrick. The prize is given for the previous year's most significant software achievement in computer software by an IDEC software centre member who is under 25.

Carrick, who is 24, works as part of the central control unit team and was recommended mainly for her work on an Amdahl-based simulator.

First prize was £350 and a certificate. Runner-up Steve Martin was also presented with a certificate. Carrick joined ITT-IDEC as a graduate at the beginning of 1979.

■ **John Dowling** has been named chairman of Whitburgh Automation and its subsidiary Minster Automation. A director of several public companies, Dowling has had management experience with English Electric, Compagnie Generale d'Electricité, Aberdare Holdings and Charringtons Industrial Holdings.

■ **Bill Hendry** has joined the board of MAP Computer Systems with responsibility for developing the operation and expanding the sales of computer systems from the Glasgow office. He used to run his own company for the servicing of terminals and had a spell at Reuters managing its data communications equipment.

■ **Yasbutoshi Sakamoto**, formerly an engineer, has joined Mitaka in Leamington Spa as technical translator. He will specialise in translating electronic and computing material.

■ **Tom Frann** has been appointed vice-president and director of systems support for Europe at National Advanced Systems. He was formerly manager for systems support of NAS in the US. He has been with the company since 1976.

■ **Alan Griffiths** has been appointed CAD/CAM systems consultant at Sperry Univac. He will be mainly concerned with the newly launched UNIS CAD design and manufacturing system. He was formerly with Kronsberg Data Systems.

■ **Don Moorhouse** has been named marketing manager at Autosense Equipment. Formerly senior sales engineer, he has been with the company since 1979.

■ **John Curtis** has been named senior sales engineer at RIFA. He was previously a sales engineer at Siemens.

■ **Annette Edwards** and **Andrew Bailey** have left Arthur Anderson to join MSA. Edwards, formerly a management consultant, becomes a systems consultant at MSA. Bailey, previously an accountant, will be going on MSA's career development course.

■ **Alex Kachellek** has been appointed production manager at Casc. He was previously with Sperry Gyroscope.

■ **Margaret Griffiths** has been appointed managing director of Stage One Computers. She joined the company in 1979 as a partner.

■ **Peter Irons** has been appointed manager at Dataproducts International. He was formerly head of product management at the company's manufacturing facility in Dublin.

■ **Alan Wooley** has been appointed management service manager at Argos distributors. He was formerly with Main Stop and International Stores. All three companies are part of the BAT Stores group.

■ **Peter Lloyd** is the new vice-president and general manager at Optimen, the disc drive unit of Shugart. He joined Shugart two years ago as director of strategic planning.

■ **Chris Bryce** and **Jim Potter**, both founder members of OCR ScanData (UK), have been appointed executive directors to the company board. Both were with Interscan before joining ScanData in 1976.

■ **Dick Wilkinson** has been appointed manager of communications at MDS Computer Systems. He was previously manager of the company's South-West sales area.

■ **James Berrett** has been named president, chief executive officer and member of the board of directors at Computervision in the US. He was formerly group vice-president, systems group, at Honeywell in Minneapolis.

■ **John Morley** has joined Vermont Research as marketing and sales manager. He was previously European sales director of display products at Datagraphix.

■ **Dr James Henderson** has been appointed managing director at electronic security firm Mastiff Security Systems. He has been scientific adviser to British Aerospace since 1978, and was formerly chief scientist to the RAF and a member of the Air Force Board.

DIARY

SEPTEMBER 8

OTL Gives Voice to Information Management. Meeting on OTL's Information Management Processor. Institute of Information Scientists WP and computer information systems special interest group. OTL, London. Tel Helen Harris on: 01-229 5069.

SEPTEMBER 14

Expert Systems. Speaker Alex d'Agapeyeff. IDPM West London to Oxford branch. Bell House Hotel, Beaconsfield.

SEPTEMBER 16

Future directions of ICL. Speaker Robb Wilmot, managing director, ICL. BCS London branch. Charing Cross Hotel, Strand, London. 6.30.

SEPTEMBER 19-24

Industrial digital and microprocessor-based control systems. IEE. Vacation School at Balliol College, Oxford. Details from IEE, 01-240 1871.

SEPTEMBER 23-24

Information systems — analysis and design working party. BCS. Open University, Milton Keynes. Details Guy Fitzgerald, 01-854 2030, ext 377.

OCTOBER 5

The impact of the new technology on management. Speaker David Fairbairn, director of NCC. IDPM Scottish branch-British Institute of Management. Merchants House, 7 West George Street, Glasgow.

OCTOBER 6

Impact of new technology on management — challenges and implications of IT for the workplace. Speaker Ted Cluff, secretary-general IDPM. IDPM Scottish branch — Institute of Management. Lecture Theatre, College of Commerce, Aberdeen.

OCTOBER 12

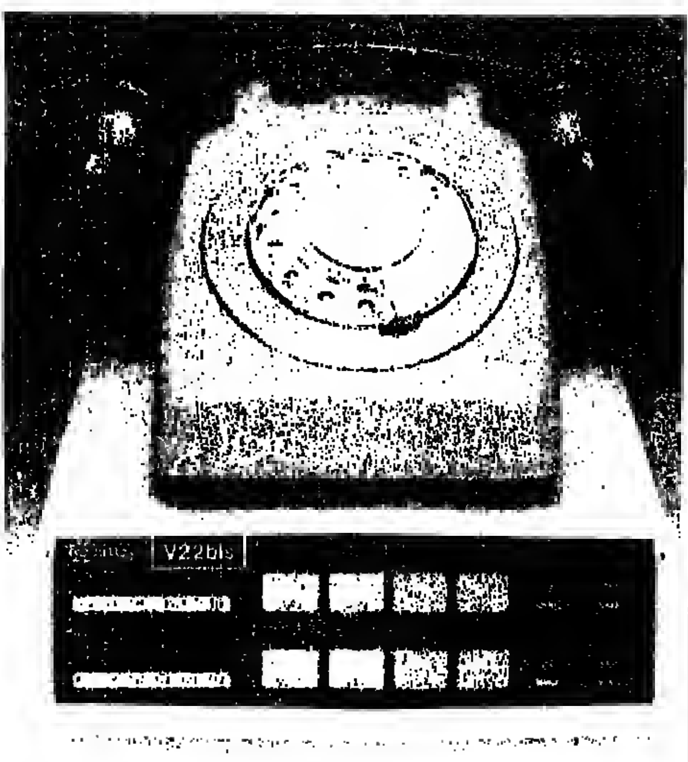
Visit to Thames Valley Police Computer Centre. IDPM West London to Oxford branch. Thames Valley Police Computing Centre, Kidlington, Oxford.

JANUARY 5-6

Viewdata. Conference on the state of the art. Institute of Information Scientists WP and computer information special interest group. Details Mrs Bird on: (051) 645 2000 ext 8611.

CONFERENCES

■ THE fourth bi-annual **USUS (UK)** conference will be held at the Polytechnic of Central London from September 9-11. USUS (UK) is the UCSD p-system users' society. Speakers include Kathleen Jensen of Digital Equipment, Charles Kellner of Apple and others from the artificial intelligence laboratory at Queen Mary College, London. Topics to be discussed will include commercial, industrial and educational applications of the UCSD p-System; real-time programming; programming for disabled people; expert systems; distributed processing and electronic mail service. Eight special interest groups will meet to exchange ideas and information and the software library will allow them to copy software free of charge. Non-members can attend. Those who would like further details of the conference, contact Netta Swallow on 01-580 0099.



The CDSV22bis 2400bps full duplex modem.

Modem operates on a single dial-up line

A MODEM that operates at 2400bps, full duplex in synchronous or asynchronous modes on two wires, either a single dial-up line or a two wire leased circuit, is announced by Dacom Systems.

In its synchronous mode the CDSV22bis modem will find applications with users who wish to run equipment employing full duplex protocols such as SNA, SDLC, X25, etc, over a dial-up line.

It is also ideal for use, says Dacom, with a statistical multiplexer where it will enable up to eight VDUs to share a single dial-up telephone connection.

In its asynchronous mode it can enable remote VDU users to access their minicomputer over single dial-up connection at a speed of 2400bps.

The CDSV22bis comes from the same stable as the proven CDSV22 1200bps full duplex dial-up modem and, like the CDSV22, the new CDSV22bis features an automatic adaptive equaliser for the best possible performance.

The CDSV22bis also features a user friendly touch sensitive control panel that makes the unit easy to use, ssys Dacom.

Dacom Systems (CW), 200 Conniburrow Boulevard, Milton Keynes MK14 7AH. Telephone (0908) 676797.

Computer comfort

TWO developments in the Baseline range of computer furniture from W. H. Deane will be introduced at the London Business Show in the Barbican Exhibition Centre, from September 28 to October 1.

Ergomatic Control, a new electrically operated raise and lower mechanism, extends the application of ergonomics which is a central feature of the Alan Hunt-designed Baseline range. Powered by a low horse-power electric motor, Ergomatic Control allows operators to adjust VDU screens to their exact working requirements in terms of height. The new mechanism is seen as a major contribution to correct operator posture and consequent working efficiency.

Simultaneously, the complete Baseline computer furniture range is to be made available in Ash real wood finish.

W. H. Deane (High Wycombe) (CW), Wooburn Green, High Wycombe, Bucks HP10 0HH. Tel: (06285) 25011.

Saving time at keyboard

AN electric copyholder, the Easy Reader, is designed to cut out the wasted time word processor operators, copy typists and most keyboard operators spend moving a ruler down an original document line-by-line. The Easy Reader does this job for the operator, leaving both hands free, enabling faster rates of data input to be achieved.

The Easy Reader holds an original typescript or manuscript at eye level, eliminating bending and bad posture. Text is illuminated by a low powered strip lamp and a transparent cursor magnifies text twice.

Operated by a two-way electric switch foot pedal, a rubber coated roller silently drives the original page up or down behind the cursor, one line at a time.

Supplied with a sturdy baseplate and support arm, the unit can be adjusted to a convenient reading height and angle.

The Power Equipment Co. (CW), Kingsbury Works, Kingsbury Road, London NW9 8UU. Tel: 01-205 0033.

Rockwell 'hat-trick' with low-power single chip micros

THREE new low-power, single-chip microcomputers that directly drive fluorescent displays, keep real time, and provide a wide variety of controller functions are announced by the Electronic Devices Division of Rockwell International.

Featuring a low-drain standby power mode with "blink" wake-up for both processing and clock time updating, the new four-bit microcomputers offer enhanced fail-safe advantages for pre-set, clock-activated appliance and security controllers, energy-management thermostats, medical and scientific instruments, hand-held equipment and similar products.

Designated the MM78LS, MM79LS and MM89LS, the new devices join five existing models in the Rockwell PPS-4/1 family of PMOS one-chip microcomputers, more than 30 million of which are now with customers worldwide.

Primary power consumption is typically 15 milliwatts at 6.5V to 11V. In a standby mode, during which all data is retained in RAM, power consumption is typically 35 microamps.

The low power consumption characteristics make feasible either primary or standby battery operation, says Rockwell. If primary power is interrupted, a "blink" wake-up mode is activated after detection by on-chip circuitry.

In the wake-up mode, power-fail sequences established under software control, reactivate the processor or update the real-time clock with a once-a-second "blinks".

Real time control and time-keeping options can be established from a 50 or 60 hertz input, a 32KHz digital watch cryatal, or an external 800KHz clock.

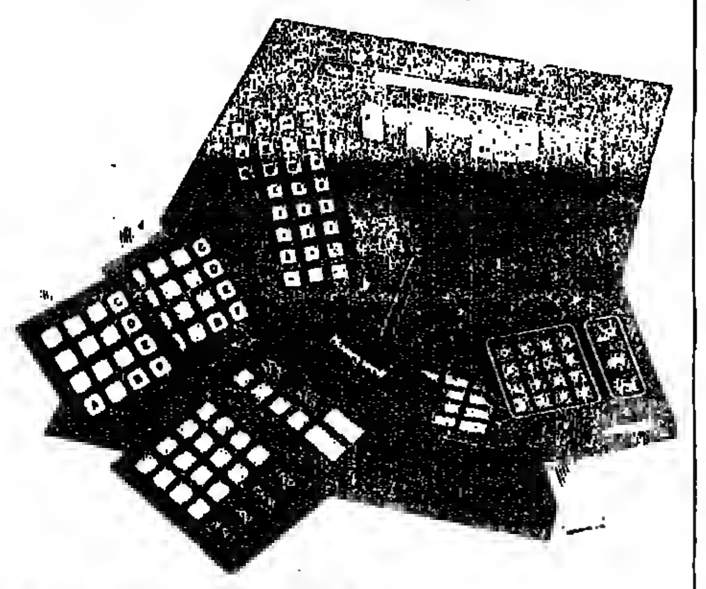
To facilitate development of ROM codes for system applications in conjunction with the Rockwell System 65 development equipment, Rockwell provides Emulator Devices for each of its one-chip microcomputers.

The MM78LS in standard 40-pin DIP is priced in the 1,000 quantity range at \$6.60 each. The MM78LS Emulator Device in 64-pin DIP is priced at \$65 each, and available now.

First production quantities of MM78LS devices with ROM codes are scheduled to begin this month.

The MM79LS and MM89LS devices both have 256 × 4 RAM; 34 I/O lines that can be software configured.

Rockwell International, Electronic Devices Division (CW), 4311 Jamboree Rd., PO Box C, Newport Beach, CA 92660.



Honeywell's custom-designed flat touch panels.

That Honeywell touch

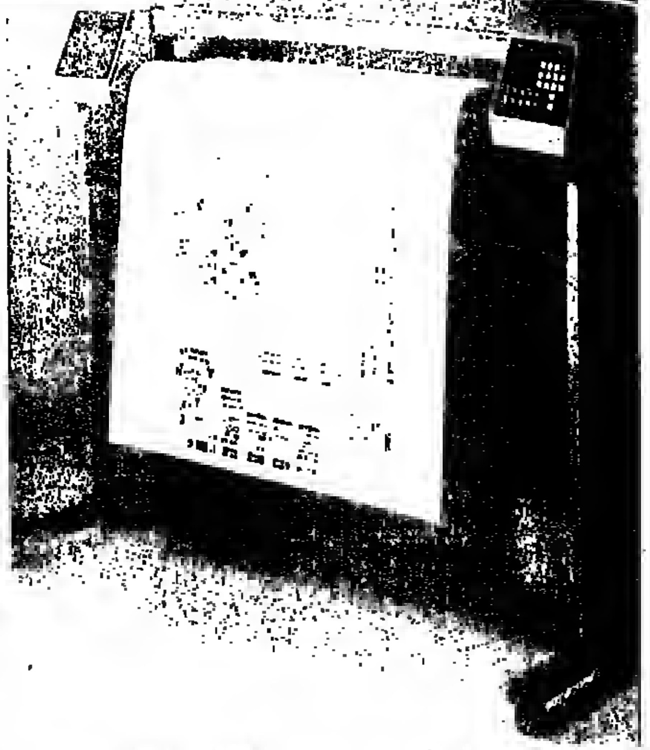
A NEW range of custom-designed flat touch panels to complement Honeywell Control Systems' range of Hall effect keyboards, is said to be suitable for interfacing with microprocessors or low-level circuitry and can be designed to meet specific OEM needs.

Design options include the number of switching functions, overall size and layout, choice of colours and graphics, type of panel surface, and visual, tactile, or audible feedback.

Positive feel of the switching action is assured by the use of snap-discs built into the membrane at each switch station. This is complemented by surface embossment of rims surrounding the touch surface, a Honeywell option which facilitates positive finger positioning on the switch station.

The touch panels are especially suited to applications where protection against difficult environments is critical.

Honeywell Control Systems (CW), Honeywell House, Charles Square, Bracknell, Berkshire RG12 1EB. Telephone (0344) 24555.



Hewlett-Packard's Model 7585A drafting plotter.

Complex plots with minimal programming

HEWLETT-PACKARD has expanded its line of plotters to include a new E/A0-size unit, Model HP7585A, which it says offers throughput speed and output quality equal to higher-priced large plotters now on the market.

Designed around the micro-grip drive technology introduced in January, 1981, on HP's D/A1-size plotter, the new HP7585A features microprocessor control, high resolution, and speeds up to 24 inches/sec.

Its pen-handling capabilities include automatic setting of pen force and writing speed to accommodate different plotting media and pen types; automatic capping of pens not in use to prevent ink dryout; and programmed selection of up to eight different pens for combinations of colour, line width and pen type on a single plot.

The HP7585A is said to perform complex plots with a minimum of programming. In order to draw a vector, one need define only the end-points and the plotter automatically joins them with a line. Circles and arcs are drawn by inputting the radius and starting position.

To distinguish between different plot data, a user can select up to seven different internally stored line types: solid, dotted, dashed, and combinations of dot and dash. The plotter's microprocessor automatically scales the line pattern between vector end points to provide uniform line style appearance and output quality.

To label a finished plot, a user may choose from six resident character sets (English, French, German, Spanish, Scandinavian and special symbols) in either of two different font styles – stick-figure or a Leroy®-like, arc-based font.

A feature believed to be exclusive to the HP7585A is that speed and acceleration are controlled by the microprocessor independent of writing direction. The plotter can be set to a maximum speed for a given drawing surface and pen type, and will not exceed that speed even when drawing diagonal lines.

The HP7585A plotter is priced at £14,992.

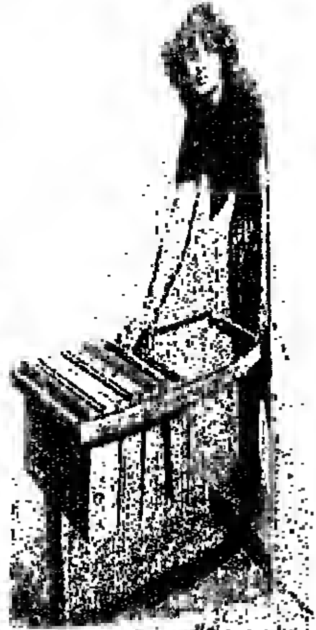
Hewlett-Packard (CW), King Street Lane, Winnersh, Wokingham, Berks RG11 5AR. Tel: (0734) 784774.

Protection of floppies

DEVELOPING from its range of microfilm reference aids and Lincdex strip index systems, Kardex is producing a series of data storage units.

First is a wallet for organising and protecting floppy discs. Made in two sizes to suit 8-inch or 5¼-inch discs, the wallet has 20 transparent pockets which "fan out" when the unit is opened, for quick and easy reference and retrieval.

Kardex Systems UK (CW), 2 Dyers Buildings, Holborn, London EC1N 2JT. Tel.: 01-405 3434.



Shannon's filing trolley.

Filing on the move

A FILING trolley for both computer printout and conventional suspension filing is announced by Shannon Datastor.

Fitted with adjustable rails to accommodate different widths of filing, the desk top height trolley is fully mobile, enabling large quantities of filing to be moved around the office.

Shannon (CW), 36 Copers Cope Road, Beckenham, Kent. Tel: 01-650 4818.

'Magic' screen replaces keyboard

A TOUCH-SENSITIVE CRT screen that is claimed to give immediate and easy access to a computer memory, supplanting the conventional terminal keyboard, has been announced by Detector Electronics of Minneapolis.

Called ToughMagic, this type of transparent control screen is regarded as the simplest method of communication between people and computer memories. And no special training or keyboard expertise is needed to operate the TouchMagic system, says the manufacturer.

TouchMagic's operating ease is particularly suited to process controls, maintenance scheduling, educational displays, electronic games and similar applications where non-technical personnel need ready access to a computer memory without having to master an intricate keyboard.

In addition, the TouchMagic panel is said to shrug off oil, grease, dirt and other deleterious working environments, making it especially suitable for industrial and institutional applications.

TouchMagic gives 256 switch positions on the CRT screen, compared to 82 with a conventional keyboard. And any or all the switch positions can be displayed on the CRT screen without recourse to a shifting apparatus.

TouchMagic has 16 horizontal electrical paths on a convex glass panel positioned opposite 16 vertical paths on a mylar sheet. Wherever the 32 paths cross is a switch position. The switch touch force is 14/28 grams; switch mechanical/electrical life is more than a million cycles. Current-carrying capacity is 250 milliamperes at 5 volts DC.

TouchMagic screens come in 12/15/17/19-inch (diagonal) sizes and can be bonded or clamped to the CRT or the surround mask.

Detector Electronics (CW), 6901 West 110 Street, Minneapolis, Minnesota 55438. Tel: (612) 941-5665.

The TouchMagic screen fits over the standard CRT.

Command and control for '999' services

Military methods are finding their way into police and ambulance services . . . Paul Gretton-Watson reports

TO most people, command and control probably has mainly military associations, and the most advanced command, control, communications and intelligence (C^3I) systems are military. Command and control techniques have also recently found a number of applications in the "999" emergency services (police, fire and ambulance).

Although the application of command and control systems in the UK is less advanced than in North America, they, like any other computerised system, claim to hold great promise for releasing police and ambulance officers from repetitive tasks to more rewarding and productive work.

An example of a system which exhibits a high degree of automation is that installed at Winnipeg in Canada. The Winnipeg system runs on IAL (International Aeradio, a British Airways subsidiary) equipment and integrates police, fire and ambulance services into one command and control system. The design of the system covers certain ergonomic points which are often neglected, and it has been used as a reference case by various systems designers.

It also provides a useful illustration of the capital cost savings that can be achieved by integrating the three emergency services under one command and control system.

> A command and control system for London Ambulance Service has the potential for reducing human error, and improving job satisfaction

In the UK, however, although considerable co-operation exists between the three services in areas such as gazetteer databases and R&D, command and control has developed in a less integrated way.

One of the more ambitious projects in the UK is being undertaken by the Metropolitan Police. A Univac 1100 mainframe will be used, 2,000 policemen will need to be trained to handle the central system alone, and the total cost to date has been £23 million. The requirements definition alone cost nearly £1 million.

The cost may sound high, but compared with the £600 million which is spent every year in running the Metropolitan Police Force, and using an amortisation period of four years, the cost only represents 1% of the total budget – a small price to pay for the claimed efficiency improvements that the system has to offer.

The system will use a gazetteer database covering all the streets in London. Initial database size will be 110,000 records, and a sophisticated US-developed Soundex phonetic searching technique will be available in order to present officers with alternative streets with similar-sounding names.

Certain terminals will have access to both the Metropolitan Police system, and the Police National Computer. In the future, certain signals such as those from burglar alarms may be digitised and entered directly, although this poses a problem in the handling of false alarms.

Another future possibility is automatic vehicle location – shelved for the present as a result of technical problems.

Similar techniques have been studied by the London Ambulance Service (LAS). Although the work is still at the feasibility study stage, rough estimates of the cost of a system needed to cover London's 79 ambulance stations is lower than that of the Metropolitan Police system. Despite this difference, the requirements of the two systems have certain similarities. For example, gazetteer searching requirements are similar, incidents need to be logged in both cases, and plans need to be prepared in the event of a London flood.

In other respects, though, the requirements differ; response times at VDUs need to be faster in police systems than in ambulance systems, and the LAS may need to use different phonetic searching techniques because although CPU overheads are generally trivial, the Soundex phonetic searching technique requires a flexible and relatively expensive underlying database system, as there can sometimes be as many as 200 locations with similar names, and which thus have the same Soundex code.

The studies have so far shown that a command and control system for London Ambulance Service has the potential for streamlining the operations by reducing human error, increasing the utilisation of vehicles, reducing response times in the handling of emergencies, and improving job satisfaction.

In the provinces, the system designer is faced with a less well-defined task. In London, the day-to-day running of the emergency ambulance service is separate from that of the routine ambulance service. The former lends itself to a command and control system, and the latter to conventional scheduling techniques. In less densely populated areas of the country the emergency and routine services need to be covered by the same vehicles, and the whole task of computerisation becomes more complicated.

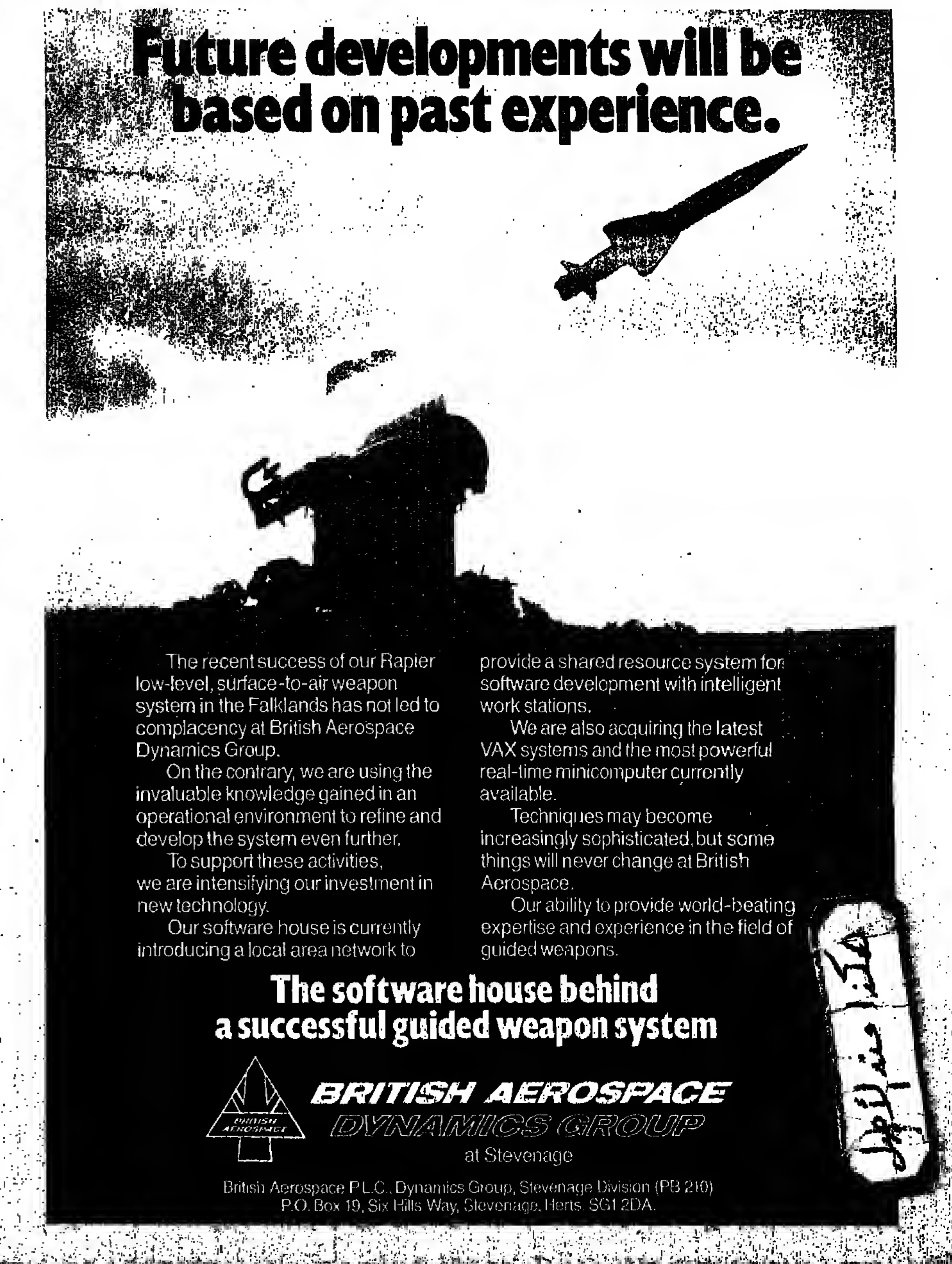
Among provincial police forces and fire brigades, a wide variety of systems have been devised to meet different requirements in the regions. Mainframe manufacturers such as ICL, Burroughs and Honeywell generally offer the advantages of well-tested and well-supported database and teleprocessing software. In some cases, though, a specialised offering from a smaller manufacturer can tip the scales against the larger companies.

For instance, Data General's Infos database provides the user with multiple-indexing facilities at relatively low cost. Ferranti offers attractive phonetic searching techniques, and Tandem provides high availability levels, although some uncertainties exist about the overheads incurred in communicating between independent Tandem processors.

It will be interesting to see whether spin-offs from the communications and intelligence aspects of C^3I systems developed for the military are of use in emergency services. At present, communications facilities provided by command and control systems used by emergency services in the UK are fairly simple, and there is little, if any, interest in artificial intelligence.

Paul Gretton-Watson is a senior consultant with Scicon.

Spin-offs from systems developed for military applications may be of use in emergency services.



GOVERNMENT COMPUTING

Newly-installed system has resulted in an eightfold rise in Central Statistical Office processing power since 1973

Major role of the computer in government financial and economic planning

Increasing demand on the Central Statistical Office and Treasury for data processing on site.

"MODERN government must have objective, reliable and timely statistical information for the efficient conduct of business". A statement of the obvious perhaps, but more easily said than done. The sentence comes from last year's White Paper on governmental statistical services; since the business concerned is that of running the country, the implications of this bald imperative are literally of national importance.

Basically, each government department is reponsible for compiling, analysing and publishing its own statistics. Key statistics from the departments flow into a central unit, the Central Statistical Office, where they are collated, processed and disseminated on a national basis. The CSO forms part of the Cabinet Office, and works closely with the Treasury.

The 1982 White Paper, published following a review of government statistical services by Sir Derek Rayner, was concerned to improve the cost-effectiveness of these services — reducing the amount of information gathered wherever possible and improving the efficiency of the overall processing.

Sir Derek had considered, but rejected a possible change to a centralised system; in continuing the existing decentralised organisation based on the departments, the government had endorsed a strengthening of financial control and the more efficient use of computers for statistical purposes.

Against this background, the Central Statistical Office has just brought into use a powerful new computer system at its Great George Street headquarters. It plays a major role in central government's financial and economic planning, distilling the essence of the departmental figures, keeping the national accounts and monitoring economic trends; running the Treasury's model of the national economy and in general ensuring that the complex flow of statistical data is consistent, up-to-date and accessible.

The new computer, a Sperry Univac 1100/62, represents an eightfold increase in CSO processing power since 1973. Before that date the CSI had used a small ICL computer while the Treasury had used an IBM bureau service; a joint Sperry Univac system was introduced in 1973 to give more power and a closer integration between CSO and Treasury operations.

The system has grown progressively to handle the increasing CSO/Treasury demand for data processing on site.

In effect the computer provides a bureau service for CSO and Treasury customers, and in particular for three main applications. These are (1) the CSO's statistical services, including, for example, figures on national income and expenditure, UK balance of payments, economic indicators and trends; (2) the Treasury's Financial Information System; and (3) the Treasury's macro-economic activities of forecasting, modelling and research, all of which contribute to economic advice to Ministers.

In producing the various sets of statistics the CSO draws on information from other departments and agencies as required — from the Department of Industry for the index of production, for example, and from Customs and Excise. Individual departments process higher volumes of data, while the CSO processes condensed amounts — sitting at the top of a wide-based data pyramid, so to speak.

The CSO's main cycle of activity is quarterly, in line with the publication of the main economic indicators such as gross domestic product, input, and expenditure. At that point the main economic data are passed across for incorporation in the Treasury model.

Input for the macroeconomic work (and for the CSO statistics) comes also from the Treasury's Financial Information System (FIS), which contains a large database of public expenditure information. It is the basis of the figures in the government's Public Expenditure White Paper, presenting government's rolling nine-year plan (four years ahead with corresponding figures for the past five years); and in the annual Supply Estimates (giving details of estimated cash requirements of government departments for the coming financial year).

Using the FIS Treasury also monitors public expenditure, on a monthly and quarterly basis, with special emphasis on cash-limited votes.

> **'Microcomputer based terminals are being introduced so that the Treasury users of the system will be able to extract information directly. And as other government departments enhance their own computer systems it is expected they will supply the Treasury with computer-readable input.'**

Within the Treasury, it is the general expenditure group which is concerned with the totals of public expenditure and of cash-limited expenditure, and with general strategy. Specific expenditure divisions, responsible for the various government departments, handle the monitoring activity.

From the FIS, data flows both to the Treasury model and to the CSO. Whenever the Treasury economists conduct a round of forecasting using the model they must know the latest plan for public expenditure, analysed by economic category, as well as the historical figures. The historical figures go to the CSO for publication and reconciliation in the national accounts.

One of the main reasons for spending money on developing the FIS was to ensure that the Treasury, and therefore the government, received the most up-to-date information on expenditure. The system which was introduced at about the same time as the concept of cash limits, enables the Treasury to keep track of actual expenditure more closely than was previously possible.

In its original form the FIS followed traditional lines, with input on magnetic tape from the Paymaster General's office, and on forms from the departments for punching on to cards. Output came from line printers.

Now, in addition, microcomputer-based terminals are being introduced so that the Treasury users of the system will be able to extract information directly. And, as the other government departments enhance their own computer systems, it is expected that they will supply the Treasury with computer-readable input instead of the forms.

Extra computer support (via the terminals, for example) is seen as the way to improve the quality of information analysis that the Treasury staff can give their briefing material for Ministers. These improvements are being phased in gradually.

The content of the FIS database has to reflect any changes which may be made in the nature of public expenditure planning. During the past year, for example, the public expenditure plan has been moved on to a cash planning basis. Thus the next White Paper will show the forward years in cash terms; previously they were expressed in volume terms on a constant-price series.

Another factor which could alter the system would be any change in the way the expenditure is classified. At present about 5,000 categories are used in the current year system (the supply estimates) and about 3,000 for public expenditure (nine-year plan) purposes. The auditing that is done by the Exchequer and Audit Department reflects these categories.

The third main task of the CSO computer is to support the Treasury's macroeconomic activities — forecasting, modelling and research. The model is used in preparing the Treasury's own forecasts published twice a year.

The model handles about 1,050 economic variables, of which 750 are defined in mathematical equations and 300 are "exogenous" variables which are based on assumptions. Exogenous variables may include items of government policy, for example, and outputs from a world economic-prospects model which includes other national economies.

Thus the model is based on a set of about 750 equations, its complexity reflecting that of the real world. This basic software has remained the same since 1973, though the form of the model itself is continuously changing. Individual variables can be "fixed", directly or indirectly, to reflect a judgment on (for example) the path that the exchange rate will take.

> **'The model is based on a set of about 750 equations, its complexity representing that of the real world. Individual variables can be 'fixed' to reflect a judgment on the path that the exchange rate will take.'**

To be useful in practice, it is not sufficient for the model to be as accurate as possible in the theoretical sense: it must also be designed to be relevant to the real business of government. It must reflect and respond to the likely questions that will be put to it; it must be "tuned" to be sensitive to the factors that determine policy.

The Treasury is obliged under the Industry Act to make available both its forecasts and its model for public use. Twice a year it issues a version of the model and its associated database; the regular customers include two "Treasury model clubs" (known respectively as ITEM and the St James' Group) whose members represent a cross-section of British industry, commerce and finance. The House of Commons Library has a link to one of the clubs so giving MPs access to the model.

The clubs' versions of the model program are run at commercial computer bureaux where they are also available for individual members of the public to use. The difficulties and expense of mounting and running these large programs and preparing a forecast database as well as the considerable (economic and computing) expertise required to use the model competently were the factors which led to the formation of the clubs.

They provide a means of sharing the costs of computing and the specialised manpower required. Despite this it is impossible for a club always to keep pace with the model changes being made inside the Treasury. Time is needed for converting the programs and for learning to use each new model.

Though the Treasury and the outside users may be at some point employing the same model and the same database, their conclusions may well show marked disparities, depending partly on the assumptions made and also on the way individual users apply their judgments.

What are the assumptions on interest rates and the money supply, for example, and what specific mechanisms relating other factors have been imposed?

Another uncertainty, which can be misleading, concerns the accuracy that can reasonably be attached to the forecasts emerging from the model. Crude estimates of error margins can under-value the true quality of the simulation.

The full definition of the model is published about once a year. To run the full model demands an increasing amount of computer power as the model has become more complex (eg the addition of a monetary sector in 1978) despite periodic housekeeping to contain the number of variables. Recently the treasury has introduced a fairly simple algebraic type of language for adding to or overriding relationships defined in the programmed model. Such facilities, which provide added flexibility and help in the application and quantification of judgment, are inevitably at the expense of ease of use and computer time.

Pre-budget calculations mean intensive use of the Treasury model, as simulations of different policies and combinations of policies are tried out. But the model is in active use throughout the year — to the extent of about 8,000 runs on the computer in 1981.

These, then, are the three flows of work which converge in the CSO's new computer system which operates 24 hours a day, five days a week and when necessary at weekends. Bureau-type work for the three main tasks is split into roughly equal thirds. Over the next few years the power of the present 1100/62 could be doubled if necessary, but the precise pattern of growth will depend on the extent to which online terminals are adopted, at first in the Treasury, later in other government departments and more generally in the prospective growth of demand.

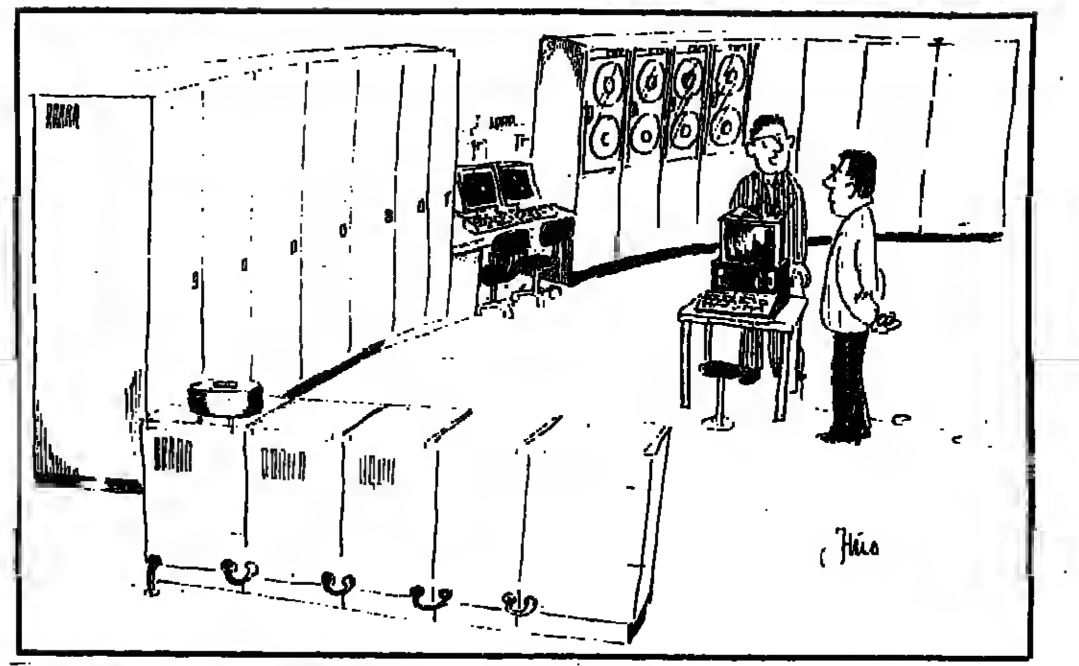
A growth in graphics and its integration with text processing will also form part of the future development of the CSO system. Graphics already are used to distil the maximum information into the most readily assimilable form for policy papers and forecasts for Ministers. Computer-produced tables were incorporated in the 1981 balance of payments Pink Book.

Online input of figures from departments has begun with terminal links from the Department of Industry. And a new database is being constructed in an updating and improvement of an existing magnetic-tape service which will supply main economic indicators to computer bureaux, the House of Commons Library and other outside users.

BOOKS

Fruitful source of ideas for the DP manager

Software Engineering Economics. Barry Boehm. Prentice-Hall. $32.95.



"To save time powering up we use this one . . ."

THE two authors most widely read by DP managers no doubt are James Martin, with his numerous books on telecommunications and other aspects of DP, and Peter Drucker, the management theorist and consultant.

Software Engineering Economics may well earn a place beside those two worthies on the bookshelves of DP managers struggling to bring in projects on time and in budget — in other words, just about all DP managers in shops large and small.

Boehm, director of software research and technology for TRW, has produced a massive (732 pages, plus references and index) tome that should be a fruitful source of ideas and inspiration for many DP managers. This book is intended as a textbook for a college- or graduate-level course in software engineering economics. As such, it contains an appropriate number of formulae and models. Nevertheless, it is by no means dull or dry.

Instead, Boehm, who has been involved in the DP field as a practitioner and author for more than a dozen years, has provided an easy-to-read book that's chock full of models and references.

Boehm has filled his book with a healthy mixture of theory as well as practical example. Many DPers and DP managers like to think of themselves as immensely practical people with little use for theory. When I encounter that orientation, I often recall the words of an eminent psychologist, who observed, "There is nothing so practical as a good theory." In a nutshell, the translation is that a good theory serves as a kind of roadmap, guiding action and research. And that is where this book will come in handy.

Consider, for example, Boehm's chapter on cost estimating. He discusses several estimating strategies — estimation by analogy, Parkinsonian estimation ("work expands to fill the time available"), price-to-win estimating, and three others — along with the pros and cons of each. This discussion, like the rest of the work, is well documented with references to other studies and papers; that means interested readers can refer to original papers.

Boehm's not-so-startling conclusion on the subject of estimating project needs and costs, by the way, is that the strengths and weaknesses of the methods he discusses complement each other, and a combination of approaches will probably be most satisfactory.

A good part of this book — perhaps the bulk of it — is taken up with an estimating method called COCOMO, an acronym for Constructive Cost Model. COCOMO provides certain basic assumptions, and an orderly way of estimating cost, effort, and duration of various types of software projects. These will undoubtedly be of considerable comfort to the average, harried DP manager, who in many cases seems forced to do some budgeting "by guess and by gosh."

Although Software Engineering Economics will be an important contribution to any manager's bookshelf, it should not be expected to solve all a manager's problems. For example, in the discussion of structured programming, I was unable to find much information about some of the practical — ie, political — problems of actually introducing these methods and winning the co-operation of all parties concerned. Granted, the scope of the book is not intended to extend to such discussions; nevertheless, readers should not be disappointed when they do not find this information.

However, in some ways, Boehm makes up for it. Towards the end of the book is an interesting, well-summarised discussion of research on behaviour and personalities. The research findings Boehm discusses, and the implications of these findings for managing DPers, should be good food for managerial thought.

Howard Karten

Strategies for the Eighties

Information Resource Management — Opportunities and Strategies for the 1980s. William Synott and William Gruber. John Wiley & Sons. 356 pp. £18.50.

INFORMATION is of vital importance to the everyday activities of virtually all organisations. Techniques to aid the management of information resources will therefore be of value to small and large enterprises.

This book describes 68 tested and recommended strategies to aid the IM task. They should appeal to all those managers likely to encounter the increasingly complex information management problems of the next decade.

The 68 strategies form the foundations upon which the whole book is based. From these stem the 13 chapters that make up the book. These, in turn, are organised into three parts: the new management, management integration and information resource management.

Part One introduces the strategies and suggests how the book might most effectively be used. It then discusses the future role of the DP manager as, during the 1980s, data processing evolves into information management.

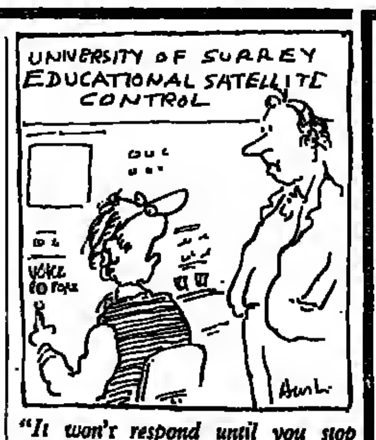
The substance of Part Two is essentially integration. Here, the authors discuss techniques for increasing the influence of the IM function within an organisation, how to establish effective user relations and methods for closing the communication gap with top management.

The third part of the book is by far the largest. It contains chapters on human resource management, hardware and software, telecommunications, office automation, project management/selection, and techniques for managing distributed processing resources. These chapters account for over 30 of the 68 management strategies.

The text is well written and contains a significant amount of case study material. On some occasions, this tends to make it a little long-winded. However, readers who use the text in the way the authors suggest — as a handbook of strategies — are unlikely to find this lessens its appeal.

Philip Barker

Philip Barker is a computer consultant.



"It won't respond until you stop chewing gum and take your hands out of your pockets."

Reference text on pattern recognition

Syntactic Pattern Recognition and Applications. King Sun Fu. Prentice-Hall, 1982.

THE preface of this book suggests that its subject matter is divided into four major parts: 1. Syntactic pattern recognition using string and highly-dimensional languages. 2. Syntactic recognition of noisy and distorted patterns. 3. Learning in syntactic pattern recognition. 4. Applications of syntactic pattern recognition.

The first section, Chapters 1 to 5, accounts for about 40% of the main text and is concerned with standard material with regard to syntax analysis, parsing and formal language but directed to pattern recognition.

The chapter on formal language is mainly a summary of results and it is necessary to follow up the references to gain from the chapter.

Chapters 6 to 9 make up the second section and deal with stochastic languages for syntactic pattern recognition, error-correcting parsing for string languages and tree automata.

The remaining three chapters comprise the final two sections. These are followed by seven appendices giving illustrations and grammars for a number of applications.

The book provides a comprehensive treatment for its subject matter and will be useful as a reference text.

A. J. Powell

Anthony Powell is head of the Department of Computing and Mathematical Sciences at Wolverhampton Polytechnic.

Data acquisition system aimed at industry

DATA GENERAL has announced a new data acquisition and control product that uses an integrated 16-bit microcomputer to control industrial automation configurations of up to 4,800 digital and analogue I/O lines.

The Intelligent Data Acquisition and Control chassis (IDAC) provides a solution to end users' industrial automation/control or laboratory data acquisition problems, asys the company. It can serve as either a standalone sensor I/O system, or as a node in a distributed sensor I/O network.

As a standalone system, IDAC can be configured with a CRT terminal, dual-diskette or Winchester disc, and medium-speed printer. This system can process real time data, control processes, generate reports, and maintain test or process histories.

In a distributed network, several IDAC chassis can control different parts of complex processes.

In I/O-intensive environments, dual CPUs may be placed in one IDAC chassis. This allows one processor to handle data acquisition at maximum speed, while the other independently performs calculations or communicates with a host CPU or with peripheral devices.

The IDAC chassis has five slots available for Data General microproducts cards. These include the micro Nova MP/100 System Processing Unit (SPU), up to 64 Kbytes of combined RAM/EPROM memory, peripheral controllers and communications cards. Another 12 slots are available for any combination of DG/DAC Sensor I/O Library Cards. These cards include analogue I/O, TTL and non-TTL digital I/O, high-speed A/D and D/A converters, analogue multiplexers, relay cards, and optically isolated digital I/O and TRIAC modules.

Using this basic slot configuration, users can handle up to 192 digital/analogue I/O lines with a single IDAC chassis. Larger configurations, of up to 4,800 lines, can be controlled by using up to 18 Micro-products Data Acquisition and Control (MPDAC) expansion chassis.

IDAC can be configured with the full line of existing Data General microproducts peripherals.

Data General (CW), Hounslow House, 724-734 London Road, Hounslow, Middx TW3 1PD. Tel: 01-572 7455.

Message switches and telex terminals being packed for distribution are protected by 3M Stockwatch.

Indicator cuts risk of damage in transit

DAMAGED goods cost manufacturers a lot of money. Product liability laws are being discussed and may be introduced by the EEC in the next year – and they may have profound implications for manufacturers, transit companies and customers.

Most manufacturers are aware of the need to ensure virtually foolproof quality control, quality assurance and packaging systems.

The 3M Stockwatch impact indicator is designed to help achieve a high standard of handling in transit. It has a tiny cartridge fitted into its own self-adhesive warning label. Indicators of several impact strengths – labels colour coded red, orange, yellow or green – are available from 3M Packaging Systems Group to suit the manufacturers's products involved.

Bad handling of a parcel or package – for instance if it's dropped during transit – is recorded by the white indicator tube turning red. The transit location, when the damage or potential damage took place, is thus more clearly pinpointed and the path of subsequent agreement over the replacement costs made smoother.

Transtel Communications has just concluded a trial period with the impact indicator. Trantel's products – teleprinters and data terminals – cost between £500 and £5,000 and despite careful packaging, damage problems were experienced with one per cent of despatches. This involved about £50,000 worth of goods. During the trali period with 3M Stookwatch, Transtel reported that this total dropped to nil.

The new liability laws will emphasise the need for manufacturers to develop new systems to prove that goods left their factories in good condition.

3M (CW), 3M House, PO Box 1, Bracknell, Berks RG12 1JU. Tel: (0344) 26726.

Short-run printing service

COMPUPRINT has launched a new service to users of continuous stationery. Aimed at the small business computer market, the company claims a quick, low-cost service for printing short run computer forms.

Located in Andover, Hampshire, it provides a nationwide service that includes forms design using the latest computer-aided techniques, to produce film positives containing rules, text, reverse text, screen and pattern tints.

Sophisticated plant converts paper reels to packs.

Compuprint (CW), Unit 3, Arkwright Gate, West Portway Industrial Estate, Andover, Hants. Tel: (0264) 70216.

Dick Sheppard, Action Computer Supplies' marketing director, delivers some of the company's new catalogues to London Zoo, where a passing llama takes an interest. London Zoo was one of Action's first customers. Action, based in Wembley, has published its new 28-page catalogue covering its range of computer supplies. Items in the catalogue include flexible diskettes and accessories, ribbons, copying products, paper (continuous and rolls), continuous computer labels, printwheels and accessories, and cleaning products. The company's policy is to offer brand leaders at competitive prices with same day dispatch. The company specialises in marketing branded media to the computer and word processing markets. The catalogue is available free of charge.

Action Computer Supplies (CW), Freepost, Wembley, Middx HA0 1BR. Tel: 01-560 0770.

Low-cost bubble memory

RAPID RECALL has available a new bubble memory multimodule board. Known as the iSBX 251C, it is a commercial grade (10 to 40°C temperature range) 128 Kbyte board costing £444, which is less than 55% of previously available boards of equivalent memory capacity, says the company.

The current iSBX 251, which is specified for use over the temperature range 0 to 60°C, has also been reduced in price by about 45%, to £613 in unit quantity.

The iSBX 251C is a fully assembled and tested non-volatile memory based on the Intel 7110 one Mbit bubble memory device. The board plugs directly into any Intel iSBC single-board computer with an iSBX connector (for example the recently introduced iSBC 88/25) to provide a high density, non-volatile storage medium. This arrangement frees the host multibus bus structure for other traffic, while the iSBC board has direct access to the bubble memory.

The iSBX 251C is complete with all necessary support circuits and 16 commands are available to transfer data and to view the operational status of the bubble memory board.

Data transfer to and from the iSBX 251C can be set to one of three modes: polled access, interrupt driven or Direct Memory Access (DMA).

Each iSBX 251C board is tested by Intel at elevated voltages and temperatures.

The low-cost and ease of use of the new board opens up a new list of applications for bubble memories. Rapid Recall's technical staff are prepared to advise on the best type of bulk storage to use in a particular application.

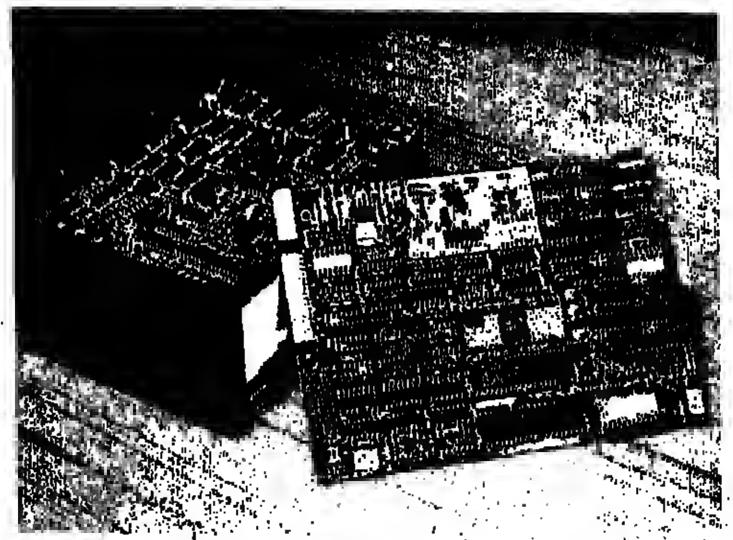
Rapid Recall (CW), Rapid House, Denmark Street, High Wycombe, Bucks HP11 2ER.

Saving time for OEMs

HAL Computers has introduced a new concept in systems development – a mini Winchester development kit which could provide the solution to a major problem experienced by OEMs and systems houses, that of excessive development time.

At present the incorporation of a new drive into a system may take up to six months: six months of man and equipment hours, six months' delay in offering a new product to the market. HAL's new kit, consisting of a sealed mini Winchester disc drive with compatible controller aims to resolve this problem.

The Winchester, the Tandon TM500 series is available in either 6.4, 12.8 and 19.1 Mbyte options; it is a compact 3.25 inch × 5.75 inch × 8 inch sealed unit with a recirculating filtered air system, maintaining a positive internal pressure to protect data from the risks of contaminants. Track to track access time is 3msec plus 15msec setting time with 15 seconds acceleration and braking to and from operating speed.



Mini Winchester development kit from HAL.

Each unit is pre-tested in the UK on HAL's in-house ADC tester and is supplied with a printout of its performance parameters.

The controller, on a 5.75 inch × 8 inch printed circuit board can be either fitted to the drive or easily incorporated into system hardware as needed. It features state of the art technology in a small package size, and 32-bit ECC polynominal with an 11-bit burst for error correction. Each controller can control up to two drives, with 1 MHz bus transfer rate, and is fitted with the industry standard SASI interface.

The unit also features extensive controller and drive diagnostics, on-board sector buffer, programmable sector interleaving and multi-sourced gate array technology.

The full kit requires five and 12 volts DC power supply. Documentation is provided, with HAL's in-house engineering team supplying technical support.

Hal Computers (CW), Invincible Road, Farnborough, Hants. Tel: (0252) 517175.

Streaming tape drive has start stop mode

THE Series 2000 tape drives, offering high-speed tape streaming for backup of Winchester discs and start/stop capability for normal file management operation, is announced by Digi-Data. Units will be available in the UK by the autumn.

In its streaming mode, the Series 2000 reads and records 1,600 bpi data at 100 ips or optionally at 125 ips, while the dual density unit also transfers 3,200 bpi data at 50 ips or optionally at 62.5 ips.

In start/stop mode the unit will also read and record 1,600 bpi data at 25 ips or optionally at 12.5 or 31.25 ips. Formatting at all speeds and densities is an integral function of the drive and all 1,600 bpi tapes produced by the drive are interchangeable with those produced on any Ansi/IBM compatible PE transport.

Mechanical reliability is increased by the fact that there are no mechanical adjustments and only five moving parts, says Digi-Data. A short tape path minimises tape resonance and only the tape cleaner and the head touch the oxide surface.

Since most calibrations are automatically performed by the 8085 microprocessor, minimal adjustment is required and other calibrations can be performed with a DVM. During operation, the 8050 uses servo feedback to maintain tape tension, monitor tape position and control velocity, monitoring and responding to controller commands. It performs a self-test upon power-up and supports several diagnostic rotines selectable from the front panel. The microprocessor also decreases component count, size, cost and power consumption.

Digi-Data (CW), King's House, 18 King Street, Maidenhead, Berks SL6 1EF. Tel: (0628) 29555-6.

Aircraft displays

FERRANTI has introduced a Remote Map Generator (Romag) for aircraft display systems. Developed by the company's Edinburgh-based navigation systems department, Romag generates map display signals for presentation in the cockpit from a unit located remotely within the aircraft.

Romag is based on the technique of storing maps on a film strip. It uses the Standard Ferranti film traction module and films which are currently in production for the Tornado, F-18, and Indian Air Force Jaguar.

The film is positioned by high-speed servos in response to present position data from the aircraft's navigation computer. A 1553B interface is provided. Maps at several different scales may be stored on the film and selected at will.

Ferranti (CW), Navigation Systems Department, Silver Knowes, Edinburgh EH4 4AD, Tel: 031-332 2424.

Protocol converter

A PROTOCOL converter for the IBM systems user is available from General Audio and Data Communications, part of the CAE Group. The ICOT 352 will allow a variety of up to 12 glass teletypes to emulate the more expensive IBM 3270 type display stations.

It connects Ascii terminals to the IBM system. These can then emulate typical 3270 functions.

CAE (CW), Akeman Street, Tring, Herts HP23 6AJ. Tel: (0442 82) 4011/5551.

Compec Scotland opens in Glasgow next Tuesday. Jon Whiteley takes a look at the country's computer industry

Past success promises a bright future for electronics in Scotland

WITH its emphasis on heavy industry, the Scottish economy has been particularly hard hit by the recession. Unemployment is well above the national average and Scotland is usually reckoned to have more than its fair share of urban deprivation.

So, with weather arguably worse than Manchester's, just where are the bright spots in the Scottish economy?

One bright spot is the electronics industry. Since the last war when Ferranti experienced a major relocation into Scotland, and since 1951 when IBM set up a manufacturing plant in Greenock, Scottish electronics has undergone a process of steady growth in output, although this has not always been matched by the same growth in employment.

The electronics industry in Scotland is made up of some 200 companies which employ about 40,000 people between them. About 20% of this total is to be found in the manufacture of semiconductors and electronic components. Information systems (roughly speaking, general-purpose computers), industrial controls and equipment and defence equipment account for about 25% each. The remainder is contributed by the small consumer electronics sector.

All the large semiconductor companies are foreign-owned, mostly by US multinationals, although one of the most important recently announced manufacturing plants will be part of the Japanese Nippon Electronics Corporation, NEC. Again, the largest information systems companies are US-owned and UK ownership is only to be found among the smaller companies.

It is interesting to note that IBM employs about 2,700 people in Scotland whereas the UK's own ICL, which has a roughly comparable computer market share in the UK as a whole, only employs 400.

Defence equipment companies are mostly UK-owned. The industrial controls and instrumentation area has had a welcome stimulation of demand from the oil industry which has led to the establishment of a number of UK-financed companies. Medical instrumentation has become something of a speciality within the area of applied electronics and there are an encouraging number of start-up companies.

> **‘The SDA is having the most success with semiconductor manufacturers in furthering economic development and maintaining employment’**

The turnover of the electronics industry was £770 million in 1979, according to study carried out for the Scottish Development Agency (SDA). Although the turnover is now substantially higher, the structure of the industry in Scotland has remained similar. Despite the fact that there are 200 companies within the industry, 36 of them account for over 90% of total sales.

The report also points to the predominance of foreign ownership in these companies as being more likely the bigger the company.

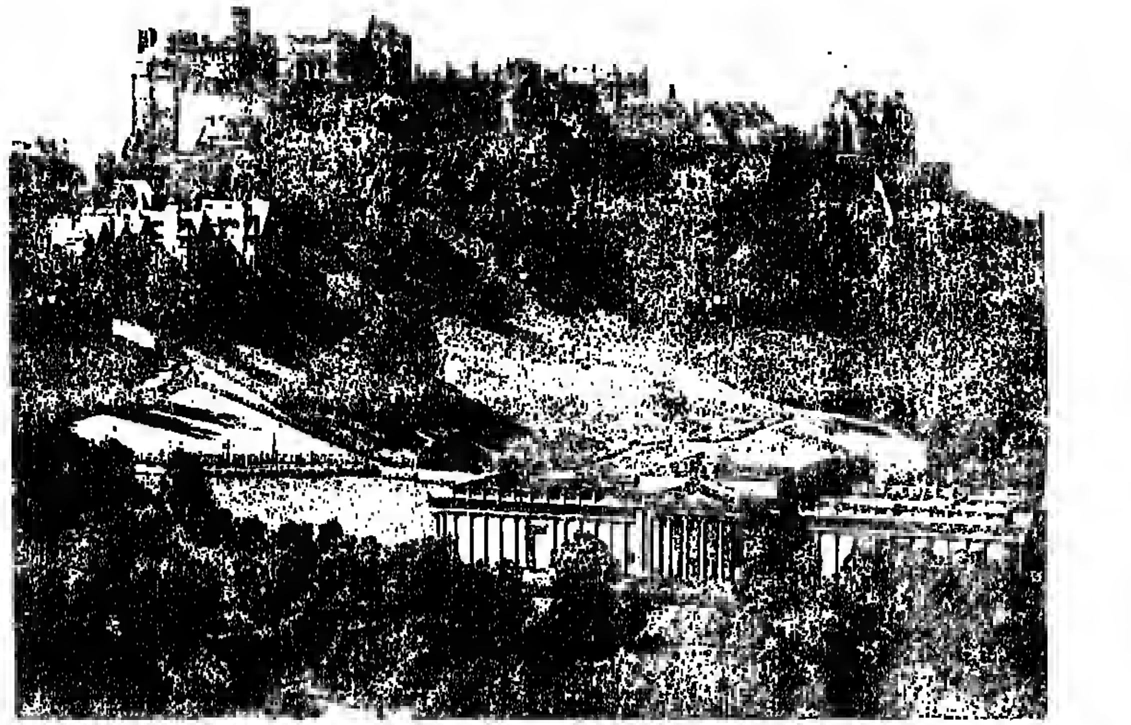
IBM was perhaps the first multinational computer company to set up a manufacturing plant in Scotland, but the first products to come from this operation were electromechanical typewriters and accounting machines. Now the plant at Greenock makes 3270 colour display terminals. Semiconductor companies have shown the most dramatic growth, though.

The largest of the recently announced investments have all been for new or expanded semiconductor manufacturing facilities. National Semiconductor will be creating 1,300 jobs with its expansion into a further 160,000 square feet of factory requiring an investment of £45 million.

Motorola will be expanding its MOS factory at East Kilbride with a new "module" to be completed in 1985, which will cost £60 million and will employ 800 people in addition to the 1,400 already working there. NEC will be establishing a new plant at Livingstone which will require an investment of £50 million and will provide jobs for 800 people.

The SDA now estimates that half of the UK's production of semiconductors comes from Scotland and this represents 10% of Europe's production.

Not only has this sector been investing massively, it has also been expanding its workforce, with many companies having doubled the numbers employed in the last three years. There have also been firms contracting even within electronics, but they have been trying to do so quietly, perhaps hoping that they will go unnoticed while attention is drawn away by the trumpeting of investment success stories.



Electronics is now the bright spot on the Scottish horison.

The SDA for the last three years has set itself a no more ambitious target than to maintain total employment in the electronics industry in Scotland at 40,000. Although about 5,000 new jobs have been created, job losses have equalled this figure.

Having established an infrastructure for the electronics industry the strategy of the SDA is to attract more US, Japanese and European multinationals, and also to encourage start-ups. The SDA wants to make Scotland a location for volume manufacture of electronics, and for design and development with the implication that the former type of activity is good for the employment figures while the latter is good for the health of industry as a whole.

The concern of the SDA is to see so-called "feeder plants" which tend to be operated by multinationals evolve into "integrated plants". Feeder plants are generally for high-volume production, but design, marketing and possibly some of the manufacture are all carried out elsewhere. Integrated plants, as the name suggests, combine many of these functions at the same location.

The SDA identifies integrated plants as contributing more to the Scottish economy because they are more likely to buy components and subassemblies from Scottish suppliers. IBM UK would probably dispute this, however, and is keen to emphasise that 90% of the Greenock plant's output is exported and that last year it placed £35 million worth of work with Scottish suppliers out of a total of £68 million.

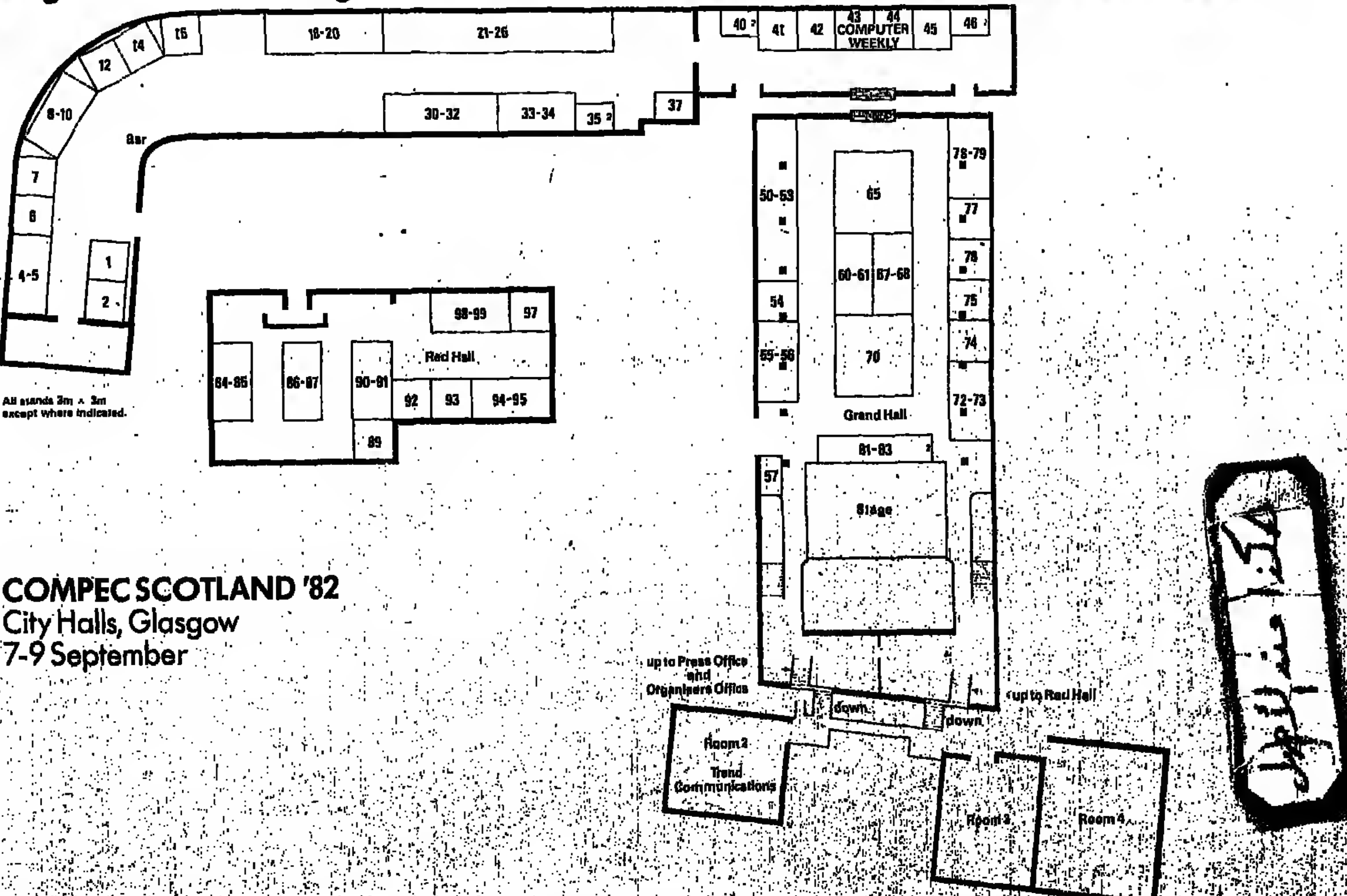
IBM also suggests that it expends some effort in seeking out local suppliers so that if more of them met quality standards then the Scottish-made content to the plants input would increase. IBM likes to remind people that the main product made at Greenock, the 3270 screen, was designed at its biggest European development facility at Hursley in the UK.

The SDA is fortunate to have as part of its sales pitch to electronics companies the Scottish universities with their reasonable record of co-operation with industry and their strengths in technical subjects. Air and road communications are good, development grants are often available and the SDA can often provide purpose-built factories with clean rooms, for example.

They can only do so much, though, as they do not actually make the investment decisions. It could be that one of the most important reasons for new investment in an area is the success of past investment. If this is so, then Scotland's electronics could have a bright future.

How to find your way around the exhibition hall

Exhibitor	Stand
Ampex	92
Case	65
Cifer Systems	84 & 85
Codex (UK)	86 & 87
Computer Talk	43 & 44
Computer Technology (CTL)	33 & 34
Computer Weekly	43 & 44
Control Data	90 & 91
Control Recording Systems	2
Cost Effective Computing	46
Data Type	77
Derwent Data Systems	74
Double L Electronics	6
DTI	37
Esco	7
FD Business Systems/Thame Systems	93
Ferranti Computer Systems	60 & 61
General DataCom (UK)	30-32
Goldsmith Computing	97
Hytec Microsystems	78 & 79
IAL	55 & 56
International Computers (ICL)	98 & 99
Interlekt Electronics	72 & 73
ITT Business Systems	76
John Smith & Sons (Glasgow)	75
Linburgh Electronics	9 & 10
Linn Products	16
Master Systems (Data Products)	50-53
MBS Group	18-20
Micom Borer	81-83
Microchange	41
Middle East Computing	43 & 44
Newbury Data Recording	94 & 95
Practical Computing/Your Computer	57
Racal-Milgo	70
Rediffusion Computers	4 & 5
Robox	42
Rodger Computer Systems	35
Scotbyte Computers	54
Scotia Office Machines	14
Software	43 & 44
Stag Terminals	67 & 68
Systemshare	12
Systems International	43 & 44
Tamaya	45
Tektronix UK	21-26
The Byteshop	40
Trend Communications	Room 2
Weir Group Management Systems	1
Zygal Dynamics	89



COMPEC SCOTLAND '82
City Halls, Glasgow
7-9 September

COMPEC SCOTLAND PREVIEW – 2

Scotland moves to the front in research and development

Traditionally Scotland has been a follower rather than a leader in industrial research, but the picture is changing rapidly, as Martin Banks reports here

SCOTLAND is rightly noted and appreciated as the source of good things. There are the many varieties of smooth amber liquid for example, for which the country has been both blessed and cursed. There is the ball game where the object is to hit a small spheroid into a hole in the ground using a wooden or metal stick. Then again there is the industrial front, where the country has had an enviable history in the role of manufacturer, especially in the area of heavy engineering.

But Scotland has never been well known as a hot-bed of research and development (R&D) into science and engineering. In the industrial field, certainly over the later years of its industrialised past, Scotland has tended to be a follower rather than a leader. In many parts of the country and in many areas of industrial activity, that trend has left its mark.

Despite this history, the country is rapidly becoming a centre of research and development efforts in some of the leading edge technologies, such as computing and microelectronics. Now Scotland is gaining a reputation for R&D leadership not only in the UK, but in the world.

This is particularly so in areas such as artificial intelligence and optical switching, areas that are typical of the country's growth in wide-ranging skills, both at the systems level and at the level of hardware and component technology.

Many of the plaudits for the trend towards R&D leadership in high technology must go to the Scottish Development Agency, which has done much to attract both industry and brains to the country.

Since the mid-Sixties the Agency has assiduously cultivated the leading edge manufacturers in the electronics industry. The cultivation has borne considerable fruit, with many of the leading instrumentation manufacturers and semiconductor houses using their Scottish facilities as a major platform to the European market.

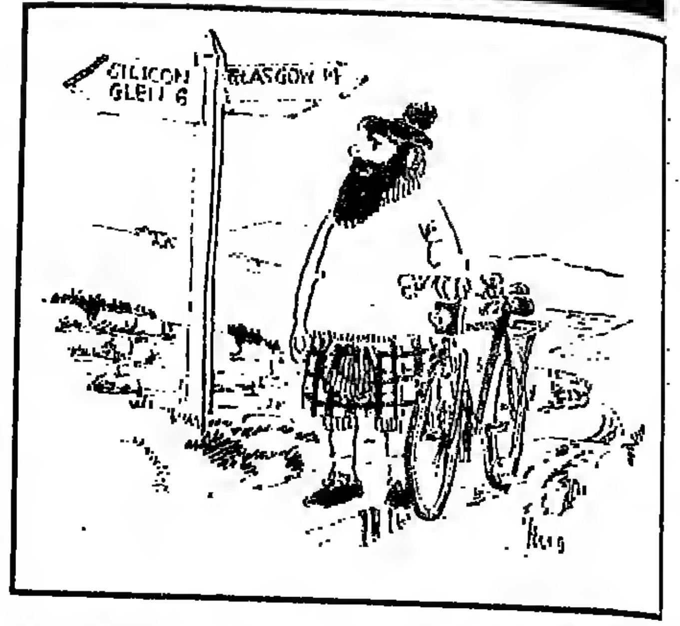
This has been particularly so with the semiconductor companies. Motorola, for example, not only manufactures chips in Scotland – as it would at any offshore location around the world – it also has an extensive design capability.

Motorola is not unusual in this respect. Many of the leading names of the semiconductor world are located in Scotland, and many of the top European designers of semiconductors have worked there. Such concentrations of expertise tend to "pressurise" the activities of local schools and colleges, and the semiconductor industry in Scotland has been no exception.

Universities like Heriot-Watt and Strathclyde are gaining enviable reputations, not only for the students they produce, but also for the research work being performed within their portals.

At Heriot-Watt, for example, research work in hand includes development of the fundamental technologies that could help to produce what is currently only science fiction fancy . . . the optical computer.

The idea, as such, is not new. In essence, the optical computer would use photons rather than electrons as the basic medium, switching signal inputs that are transmitted down fibre-optic cables by laser, rather than turning them back into electronic signals for processing.



This would allow processing of information to be carried out much faster than is currently possible, with switching speeds of the individual gates being in the picosecond range rather than the nanosecond range typical today.

At Heriot-Watt this aspect of opto-electronics is being aggressively pursued, with the emphasis definitely shifting from the "electronics" to the "opto" areas. Indeed, the university is now working in what it calls the "opto-optics" field, and the first tentative results are beginning to be seen.

Heriot-Watt has produced an optical logic memory element, which will be one of the fundamental building blocks of any future optical computer system. It has also produced one of the other fundamental elements, which it has called the "transphasor". This is an optical analogue of the transistor in electronics, and would be the basis of future logic switching systems.

Using optics in such applications offers speed and power potentials that could exceed the theoretical frontiers of electronics, leading to systems that are not only faster and more powerful, but also smaller, more flexible, and with new features that at present can only be the subject of speculation. For example, researchers at Heriot-Watt believe it may be posalble to develop a data storage device that is a 3-D matrix of, say, crystal, where the data is written and read by a laser.

> ‘Concentration of expertise tends to pressurise the activities of local schools and colleges, and the semiconductor industry in Scotland has been no exception’

But potentially enormous computing power is of little value if there are no worthwhile applications for it. Here, Scottish research efforts are bearing fruit, developing future systems ideas that are already changing traditional attitudes about how computers work and how they should be used.

The main thrust of that research effort goes under the generic heading of Artificial Intelligence (AI), which in practice is research into the application of some general techniques and principles to a growing range of problems.

Edinburgh University, with the Massachusetts Institute of Technology (MIT) and Stanford and Carnegie-Mellon Universities in the US, is a leading centre of developments in AI, both in the techniques required, and in their application to specific subjects.

In essence, an AI machine is one that has the power, processing flexibility and programming to be able to make autonomous and complex decisions or inferences while processing information.

This display of "intelligence" mimics the capabilities of humans to reach conclusions that are beyond the capabilities of normal computer systems, where there is simply a programmed response to specified inputs.

Edinburgh has concentrated its AI research efforts into four main areas. The first of these is expert systems. Here, the requirement is to produce a system that can solve problems within a tightly-defined subject area, be it playing chess or analysing blood.

In robotics, another specific area for the university, research is focusing on the development of perception and planning techniques that can be applied to automatic assembly in manufacturing industry.

Perhaps one of the most important areas being pursued by the university is in the development of natural language systems, which can communicate through text or speech in the natural language of the user, rather than in the symbolic language of computing.

The importance of this cannot be overstated. It could well become the lynch-pin of all developments that make computers, data processing systems and artificial intelligence systems "friendly" to the human user. The need for an effective interface between man and such machines continues to grow as they become both more complex and more pervasive. Natural language communications would help to overcome many potential barriers in this area.

Education is also a key element in overcoming all communications problems, and this is another vital area of AI application being pursued by the university. The technology has considerable scope for application in the education field, especially in aids to the learning process.

It shows considerable potential and offers more flexibility in teaching than a simple programmed instruction system. In this application AI can, for example, allow students to explore and develop insights in such subjects as mathematics or grammar.

The field of expert systems is the branch of AI research and development that has, perhaps, the most immediate impact. This is particularly so in areas where the complexity of the application may be beyond the intellectual capabilities of man.

One such area, of particular relevance to the overall research and development picture in Scotland, is the design of very large scale integrated (VLSI) circuits.

To design such circuits requires new types of design tools that are capable of not only handling the vast amounts of data involved but also of organising that data into a manufacturable circuit design. This task is beyond the capabilities of the human mind.

Though the manufacturing processes used to produce complex integrated circuits are of great importance – and R&D work in Scotland also covers this area – they are to no avail if the design capability is not available to exploit them. At Edinburgh University, for example, considerable work is being done not only on the problems of circuit fabrication, but on the more important areas of expert system design tools, the development of circuit and system architectures, and the modelling and verification of theoretical circuit designs.

COMPEC SCOTLAND PREVIEW – 3

Scottish oil and finance firms open new computer markets

Robert Fenner talk to some of the companies with stands at the exhibition

COMPEC exhibitions have been running for some years now, but it is only recently that regional shows have been seen as both practicable and useful ideas. The main Olympia show is large and growing. This year, for instance, to make room for still more hardware stands, the "Software Village" will be moved from last year's position on the first floor to another room adjoining the main hall.

But there are other problems associated with this concentration, and they are almost exclusively geographical. The main Compec serves the whole UK in principle, but in practice is attended largely by exhibitors and visitors from London and the South-east of England. At last year's show only 5% of those attending were based in the North of the country and only 1% or 2% were from Scotland.

This is why Compec North is in its second year, and why Compec Scotland has now been introduced in Glasgow.

The demand for a Scottish show reflects the healthy electronics industry North of the Border. In the past five years, according to figures from the Scottish Development Agency, it has received more than £400 million of investment from more than 60 companies.

Company expansions have created 15,000 new jobs in a region which traditionally looked to the manufacturing industries for its largest employers, and which consequently has been worse hit than most by the recession.

> ‘There is a long-standing Lowlands tradition of successful banks, insurance companies and investment houses’

However, the development of industries directly associated with North Sea Oil has had a knock-on effect in other areas more loosely connected with it. These, naturally, include electronics products – data processing equipment, control and instrumentation devices, telecommunications equipment and associated office products.

The oil industry has helped provide a base from which related industrial fields local to Scotland can grow. It has also provided a market into which other UK companies can sell.

Interest in the potential for computer sales in Scotland is growing. If the market for equipment in England is not yet saturated, North of the Border is barely damp, and exhibitors at Glasgow's first Compec are present largely to assess its potential, and to determine how best to realise it.

One such company is Trend Communications of High Wycombe. Trend has sold test equipment, datacoms devices and printers into the oil industry in the past – a recent deal, through ATS, was the supply of message switching gear to Chevron – and Peter Cowley, the company's marketing manager, feels that Compec Scotland may encourage other parties in oil to attend.

"We don't have our own company in Scotland," he said, "and so to make sales there we must rely on the visits made by our representatives, and on the shows available."

Offshore rigs may, of course, have something to do with the comms presence at the Scottish show. A number of the leading names in this field – Racal-Milgo, Case, Codex, Micom Borer, and others – have stands at the exhibition, and will be looking at the same prospects as Trend. There are, however, other areas into which comms products sell extensively, and in Scotland these are also well represented.

Principal among these markets in Scotland are the finance companies. There is a long-standing Lowlands tradition of successful banks, insurance companies and investment houses. Many of the major independent concerns – clearing banks such as the Bank of Scotland and the Royal Bank of Scotland, insurance companies such as General Accident and Standard Life – are among the largest in the UK, and some have been established for well over a century.

Profits before tax of Scotland's two main banks totalled $185 million, according to last year's annual reports, and the insurance companies, the merchant banks, the investment trusts and the finance houses are similarly buoyant. They not only provide an indication of the upturn in the Scottish economy as a whole – investment trusts, a Scottish innovation, look to local unlisted companies for growth businesses, and do well out of it – but also provide in themselves a market for computers and datacoms products.

Their business relies on fast, accurate, networked information on a national and international basis, and companies such as Case see these needs as providing a growing market in Scotland in which they would like to consolidate their position. Case has recently moved to larger premises in Edinburgh and has swung a £1.4 million order from the Royal Bank of Scotland to supply comms equipment for the bank's Branch Information Systems Network.

Case is attending Compec Scotland to tap this market further and to attract other business local to the region.

Trevor Rogers of Racal-Milgo, likes Compec shows generally (if phrases such as "absolutely super" and "incredibly well-organised" are anything to go by) and, of the regional shows, prefer the idea of one in Glasgow. "Scotland may be the answer," he says.

The purpose of Compec generally, however, in spite of the large presence of any one product type dictated by local needs, is to aim at the data processing market, and at the general business user. The majority of exhibitors at this year's show in City Hall, Glasgow, are in these more traditional computer areas – distributed processing systems, minis, and of course, the now almost unavoidable desktop micro.

The microcomputer market in Scotland, too, it seems, is on the rise. "Very buoyant and fast-moving" is how Jon Browne of the local Byte Shop in Glasgow puts it. The reasons for this are as straightforward as they would be anywhere else in the UK. "An increasing number of people have micros in the home," says Browne, "and in small businesses, too."

In larger firms – major manufacturing industries in Glasgow, for example, include John Brown Engineering, and Barr and Stroud of Anniesland – the microcomputer tends to work on a standalone basis as a low-cost and localised answer to specific business needs.

Exhibitors such as the Byte Shop are hoping rather cannily that the show will be attended by senior administrative staff who are keen on acquiring a micro for the needs of their own office and on losing the cost of it somewhere in the DP managers' budgets.

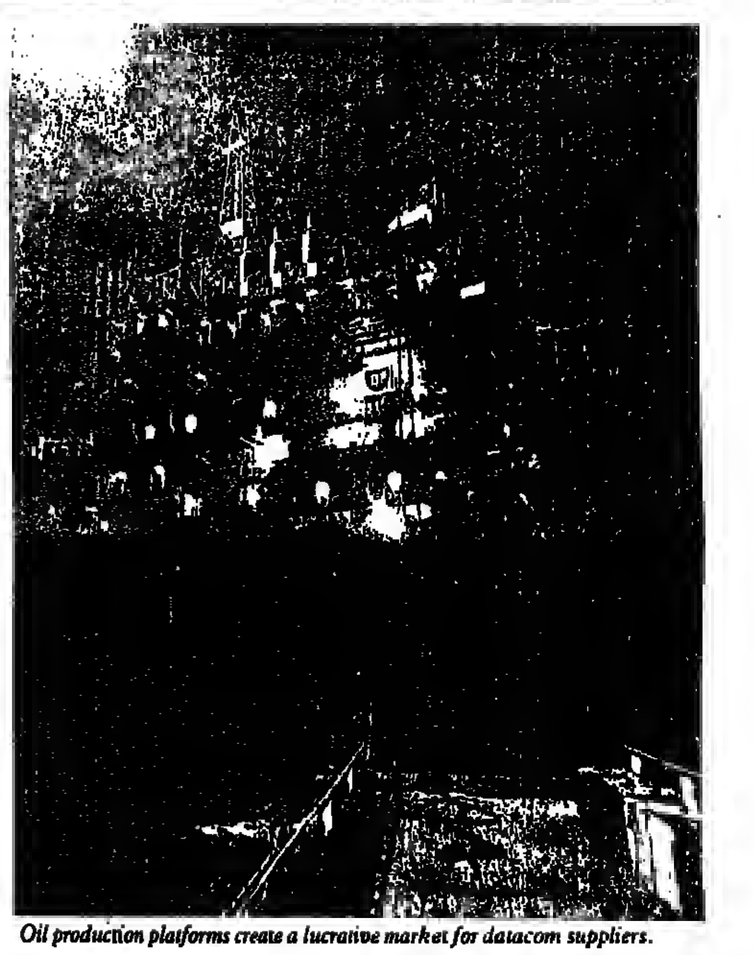
ICL will be at the show, and will be plugging the Perq workstation. Plugging metaphorically if not literally, anyway – there is some doubt as to whether a Perq will actually be on the stand – but the Three Rivers machine is being marketed extensively in Scotland at the moment, with two of them on show at Edinburgh University operating under Level 4 of the ISO network protocol, and another on a roadshow running CADRAW software from Oasys of Ove Arup. On the Compec Scotland stand will be the DRS20 distributed network system, the erstwhile Nexos word processing systems and System 25, ICL's small business computer.

A full range of peripheral equipment is also to be exhibited, among which will be found Control Data products. Dave Bennett, OEM marketing manager for CDC in the UK, displays the kind of sales oriented aggression and optimism which must bode well for potential Scottish second sources. "This is our first major British show since we made our product announcements at the NCC in Houston in July," he says, "and all the units we announced will be here."

Compecs are partly designed with opportunities for dealership and distribution appointments in mind, and Control Data is not concerned about the form in which its products reach the market – as they are, or in boxes with add-ons.

For Control Data, and for everyone else attending the show, it is the market local to the region, boosted by oil, boosted by the world of finance and the growth of micros, which counts for most.

Next year's show could be larger still, and some 40 stands have already been booked for it. According to Bennett "Compec Scotland has got to be worthwhile."



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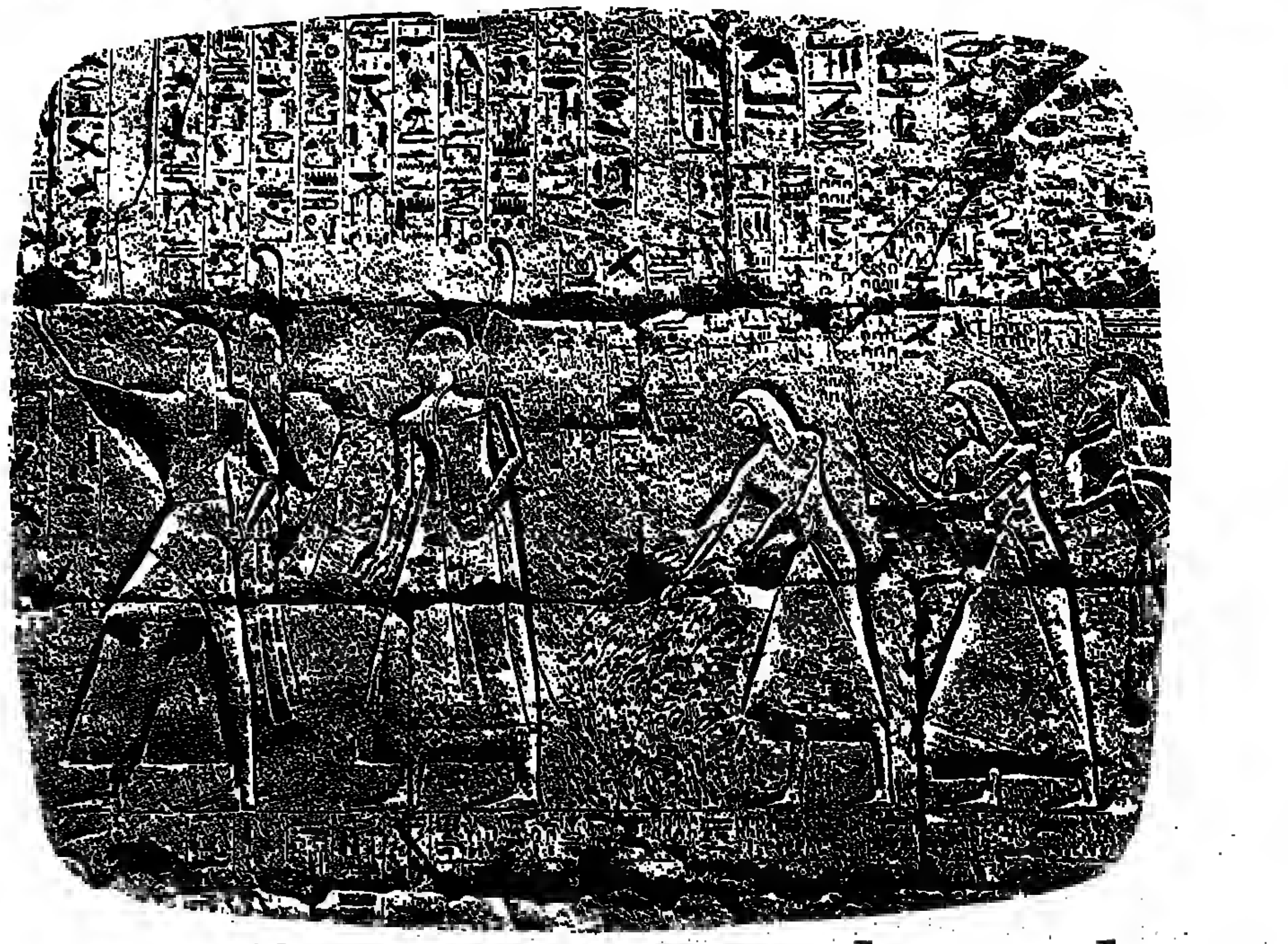

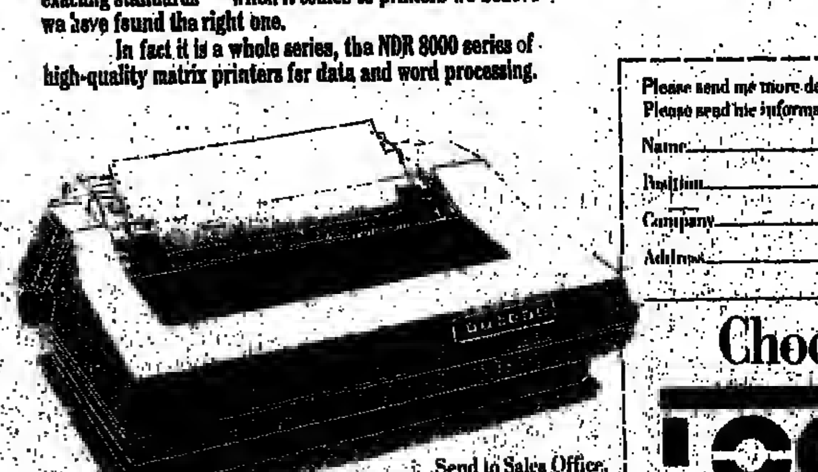

FINANCIAL MODELLING

The use of computerised financial planning is likely to be copied by smaller firms in the future, says Jim Horsley

How ICI has kept up with the changing needs of end users

The use of financial planning is not restricted to ICI headquarters.

MULTINATIONAL organisations such as ICI are like pyramids – each stone has to be perfectly tooled to provide the foundation for a strong structure. The multinational pyramid is sound when information flows freely from worldwide operating divisions up to central management. But fluctuating economies, recession and international competition can rapidly erode the foundations of even the most stable constructions.

During the last two decades ICI has introduced a vast array of planning systems to protect itself against economic storms. Like a barometer of the UK computer industry, it has moved from time sharing bureaux through to in-house mainframes and minis and finally to the standalone micro to provide staff with the tools to build both structured and flexible operations.

Accountants, business analysts and product planners have rapidly adjusted to new computer tools in the very complex trade of both financial and project planning. In an organisation which has divisions spread worldwide operating in a number of different industries, ICI has to keep up with changing demands from end users who, having tasted computer-based planning are keen to explore and experiment.

Even in such a large company resources are not unlimited. Applications have to be cross-checked and justified before being accepted. There is the additional problem of providing systems which can not only be used by a larger number of people, but which produce information in a format which is acceptable within the division and higher up the hierarchy. This makes the case for standardisation.

ICI is certainly not a company which believes in standardisation of computer systems, however. In terms of hardware, the company uses IBM, ICL, Burroughs and a range of mini- and microcomputers, and works on the basis of selecting kit to meet specific needs within the organisation.

> **It did not take long to decide that a mini in-house was a far cheaper way of handling the applications the accountant had already converted and the plans he had for the future**

ICI's software selection is also diversified. Divisions carry out their own appraisals of what the market has to offer – a choice often restricted by machine type and resource availability. Only in very rare cases can a product bridge the wide gap between the need of end users and the technical constraints of the data processing department.

During the last five years, the use of a planning system from EPS Consultants has gradually eroded technical barriers and restrictions placed on end users who want power and flexibility when and where they need it. The system, called FCS-BPS is already in use by more than 750 companies worldwide, and in the UK is installed at 55 Times Top 100 companies.

It was chosen by ICI for three reasons. First, it is transportable across a range of machines. Secondly, it has a language which can be used by accountants and business analysts to develop models. Finally, it has the facilities to handle both financial and business modelling as well as large scale applications such as consolidation.

ICI accountant Peter Whyte is involved in the head office corporate reporting group and first introduced the system into the head office accounting functions, having nursed it through various stages of growth and development.

If rapid expansion in use is a mark of success, then Whyte can count his work over the last two years as being highly productive. FCS-EPS runs on an SEL mini at the London head office which originally had half a megabyte of main storage, 80 Mbytes disc storage and three display units. This was expanded within 12 months to 300 Mbytes of memory, a two Mbyte processor and 14 VDUs. There are now plans to expand this even further with another 300 Mbytes of storage and up to 20 VDUs.

When Whyte first arrived at ICI's head office, cash forecasts, both the consolidated view of operating units and the high level central view, were processed through a bureau. Already a convert to FCS-EPS, Whyte decided to rewrite all of these programs in the EPS language, again using a time sharing service.

There was still a problem of cost, however, because a time sharing service is never the cheapest way of accessing processing power. EPS Consultants came up with a SEL minicomputer version of their product, and Whyte did not take long to decide that a mini in-house was a far cheaper way of handling the applications he had already converted and the plans he had for the future.

"The impact was felt immediately," said Whyte. Secretaries could come along and type in the information received from each division to produce cash forecasts. It would take them days to do that, whereas doing it manually could take a couple of weeks. The trouble was that we now had a machine which was running half-yearly cash forecasts and nothing else."

It did not take long, however, for other people in the accounts and planning departments to decide that this was a tool which could also cut down their manual effort. A tax calculation model was written and monthly and quarterly reporting facilities were developed which gave a rapid and precise picture of cash flow, sales and profits.

"The system is mainly used by young accountants and planners. Originally these people could appreciate the benefits but could not do much themselves on the forecasting side. Within a short timescale, they were able to build their own models and run more and more scenarios in terms of 'What if' type questions," said Whyte.

The effect of the EPS system gradually filtered its way up to board room level. As users are able to mould and develop reports to meet specific needs, the information processed from the FCS-EPS package is now sent directly to the senior management within the company. The addition of graphics capability to the system has increased this capability for presenting information in a flexible format.

It is not only the head office of ICI which has been utilising FCS-EPS. The Plant Protection Division has found it to be an effective way of reducing program development time.

Dr Chris Leggett, a business analyst with the division commented: "We had to implement a policy group system within four or five months. We decided to go for FCS-EPS because it is a high-level language and because we could reap the benefits of a very quick development time. We wrote the system, which represented about 200 program suites, in one man year. If we had been using a language like Cobol it would have taken us four to five man years."

The Plant Protection Division initially used FCS-EPS on a bureau basis, but then brought the system in-house to run on a Burrough B6800 mainframe. The system is now used for both the financial aspects of the division's activities and for assessing the development of products.

"New products can take anything from six to seven years to bring to fruition in order to make sure they are not toxic or harmful in any way. We have established a process using FCS-EPS of evaluating new products and looking anything from 13 to 20 years ahead in their development."

The growth in interest in planning systems is such that standalone micros using financial packages are also widely in use with Plant Protection division. Leggett believes that this has a double benefit – first, users like the psychology of having a machine on their desk and are therefore more at ease with the technology, and second, it leads them on to using larger and more sophisticated systems.

"The micro-based systems we have been using do not hold water against FCS-EPS but it does introduce a new generation of people to computers" Leggett explained. "When they grow out of the micro versions they are looking to build bigger models and carry out consolidation techniques which can be handled by FCS-EPS."

Soon ICI users may have their own micro version of FCS-EPS. Micro-FCS has recently been released to run on CP/M and Unix based micros and the package is now being investigated within various divisions of ICI.

From a technical viewpoint, the developments within ICI are an important indication of the way that planning systems are being used throughout the UK. If this happens within ICI now, it is likely to happen in less ambitious firms in about a year's time.

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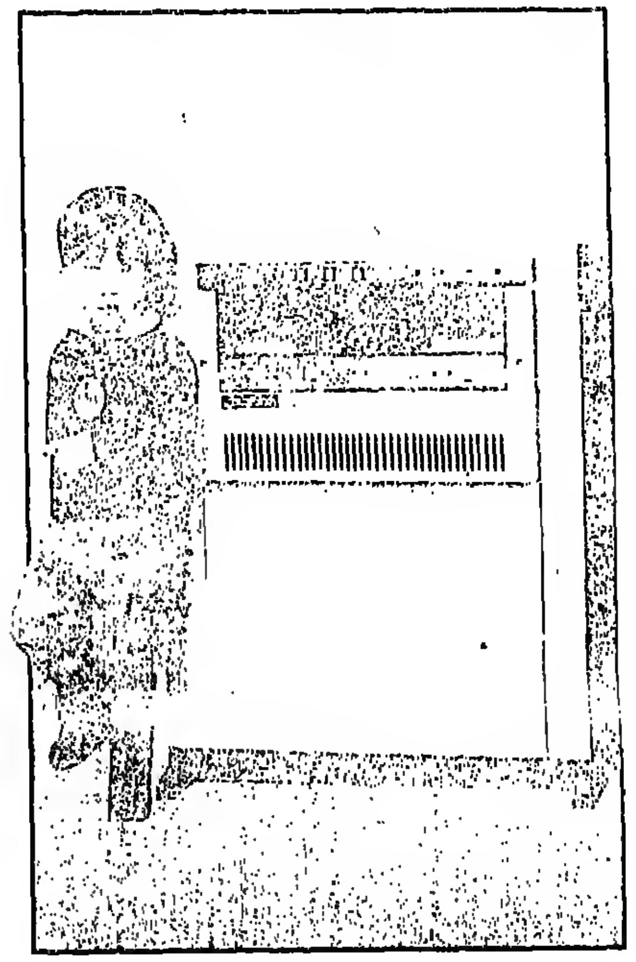

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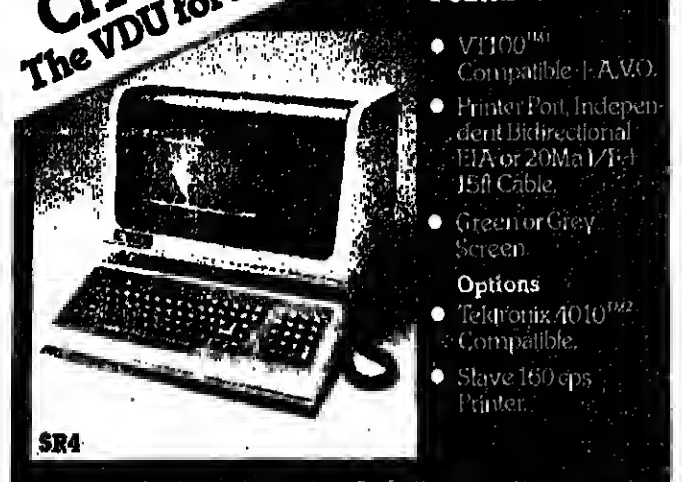

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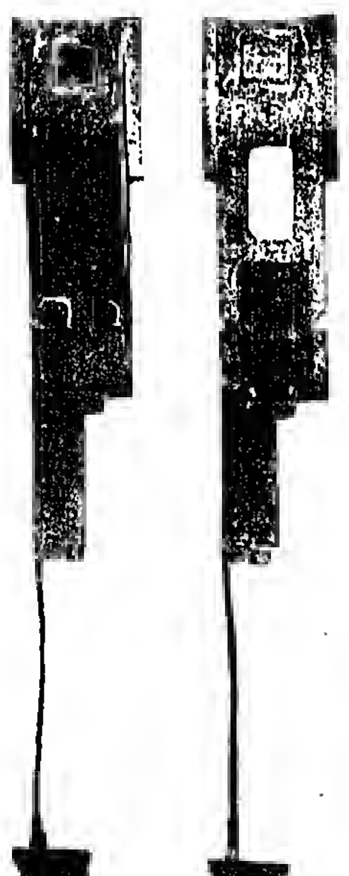

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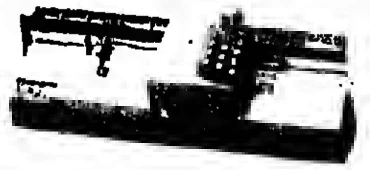

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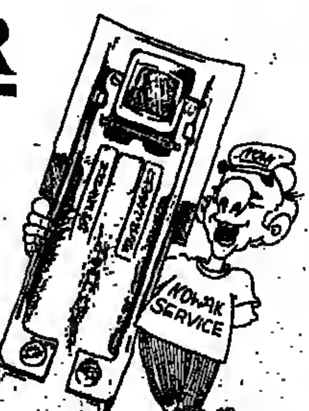

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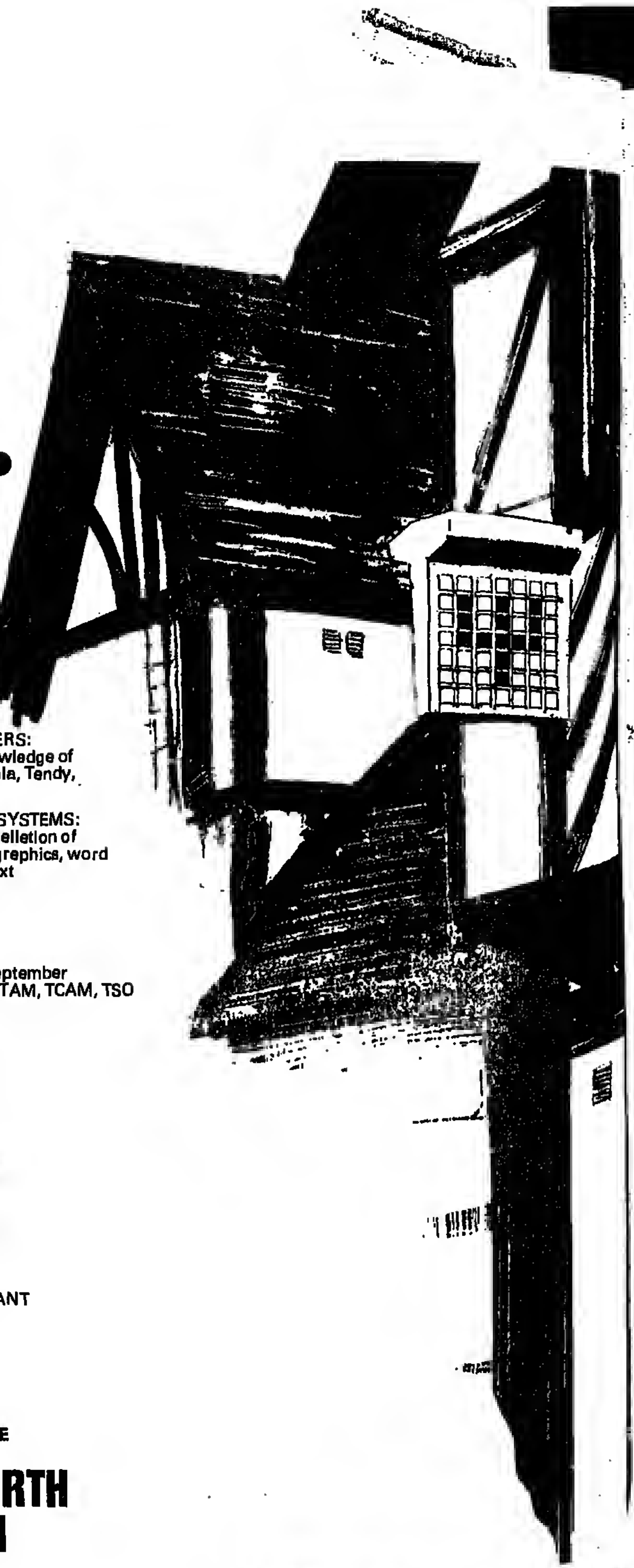

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BURROUGHS B6/6800 DMS 11 COBOL
Analysts with Life Assurance or Financial background
Analysts, various systems
UNIVAC 1100 COBOL, some with DMS
UNIVAC 90/30 OS RPG II
UNIVAC 90/80 VS9
IBM Adabas Analysts/Programmers
IBM COPICS
IBM OS COBOL
IBM COBOL, CICS & DL1
IBM PL1, various requirements
IBM 8100, DPPX, DPCX, COBOL
IBM SYSTEM 34, RPGII
IBM IMS DB/DC COBOL
IBM CICS, VTAM, COBOL/ASSEMBLER
IBM MARK IV
IBM JCL MANAGER
IBM System Programmers VM/CMS
IBM Assembler on-line DATABASE & TASK MASTER
IBM SYSTEM 38 RPGIII
HONEYWELL DPS4, IPS, COBOL
HONEYWELL DPS8 COBOL PROGS
ICL ME29 COBOL
ICL VMEB, IDMS
ICL *Applications* Manager
ICL SYSTEM 10 ASSEMBLER
ICL SYSTEM 25 ASSEMBLER
PDP RSTS/E BASIC + or BASIC + 2 (some with DATABOSS)
PDP RSX11M BASIC + 2
VAX BASIC
VAX SYSTEL
VAX COBOL
HP3000 COBOL
WANG COBOL or BASIC
PASCAL PROGRAMMERS
TANDEM, any levels (URGENT)
CORAL 66
VENTEK DATAPOINT, DATABUS
CIS COBOL
DATA GENERAL INFOS COBOL
DATA GENERAL/BUSINESS BASIC
ATE Software Engineers
ABS Multibus Simple
SMI CMC REALITY packages
SYSTEM X EXPERTISE

Contact: STEVE WHITING, STEVE CASEY
DEREK WADHAM, DAVE PEART
DAVE LONKHURST, KEITH TAYLOR
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or SANDRA CAREY

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Contact: BILL EVANS
6 months' plus assignments. September start.

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ANALYST–SMALL BUSINESS COMPUTERS:
Business application experience plus knowledge of software tools for microcomputers – Apple, Tandy, TRS-80, HP125, etc.

SENIOR ANALYST–ADVANCED OFFICE SYSTEMS:
Planning, co-ordinating and directing installation of equipment to user application areas, i.e. graphics, word processing, telex automation, data and text integration/processing, etc.

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OPERATORS
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BURROUGHS B7/6B/B900 MCP OPS
VAX OPS
DATA ENTRY OPS
VAX VMS OPS
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ICL CME

Contact: ALAN PAINE or CHRIS MAGEE

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ICL VMEB COBOL IDMS or TPMS
IBM, PL1, all levels
IBM CICS DL1 COBOL
IBM COBOL with IMS
IBM SYSTEM 34 RPGII A/P–Merseyside
UNIVAC 1100
UNIVAC 1100 DMS, TIP, Systems Programmer
IDMS DATABASE Administrator
Analyst–Various Systems
PDP RSX11/M BASIC + or BASIC + 2
PDP RSTS/E BASIC +
FORTRAN PROGRAMMERS
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ICL VMEB COBOL IDMS or TPMS
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Retraining will be given on RPG III

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Our move into the challenging world of network applications has created an immediate opportunity for a Project Leader to liaise with customers and assist them to use our products and facilities.

Possibly from a sales, management or software support background, you must have in-depth experience in at least two of the following: George 3 or VME operating systems, communications, terminal capabilities, interactive program development and modelling systems.

PROGRAMMER—
Small Systems Development £7,000

As an experienced COBOL programmer, preferably in small systems you will strengthen our team of implementation and development staff and will be involved in the introduction of new systems for our customers for use on the DRS 20—ICL's latest world beating minicomputer.

CUSTOMER SERVICES/SUPPORT
Personal Computers £7,600-£9,600

Rapid growth in demand for ICL's personal computer, a powerful micro utilising CPM/MPM operating systems, Basic and a range of applications packages, means we now need to increase our support team. Your role will be to resolve customers' queries, support sales in the development of demonstrations and explore the possibilities of new applications in conjunction with our marketing department.

You should have good 'hands-on' experience in micro computers, preferably CPM based, and their use in a science or commercial environment. A good communicator with a high level of personal initiative, you should have a sound understanding of both hardware and software and be able to relate to the needs of new and existing computers.

Baric, one of the country's leading experts in computing services in the UK, is jointly owned by ICL and Barclay's Bank. A large scale investment programme based on a firm commitment to developing sophisticated new bureau products and the growing success of our new ICL personal computer, means we are now looking for talented DP professionals at several levels to join our close-knit project teams at our Feltham head office.

Recent developments within Baric mean that you couldn't choose a better time to join us and significantly develop your career.

In addition to the quoted salaries, we are offering an attractive range of valuable large company benefits.

Furthermore, your career prospects within our expanding organisation provide real scope for career development in this highly stimulating field.

So, if you would like to join our innovative team of systems and programming professionals, please contact Peter Strode on 01-890 1414. Alternatively, write with brief career details to him at Baric Computing Services Limited, Forest Road, Feltham, Middlesex.

BARIC
An ICL/Barclays Bank Company

MICROSOFT

"We set the standard"

European Technical Manager

(UK based)

Substantial salary, plus bonus, plus car

Microsoft, leaders in microcomputer software, with such respected products as MBASIC, MS-DOS, XENIX and Multiplan, have recently set up a European subsidiary, based in the United Kingdom. During the coming year they expect to introduce a large number of new software products and to considerably expand the European Organisation.

Microsoft has a rapidly expanding customer base throughout Europe which consists of the majority of the major Microcomputer Manufacturers and, the aim of the Company is to provide the highest quality technical support to these and potential Users of their products.

Responsibility for this European Support Organisation will rest with the European Technical Manager and, as such, will provide a unique opportunity for the right individual to stay ahead in the exciting and fast moving world of microcomputer software.

Understandably, the qualities sought in this individual, therefore, will be a thorough understanding of microprocessor systems software and a sound foundation in computing principles. This would have ideally been gained in the area of ASSEMBLER programming, microprogramming or operating systems. Because of the Company's extensive involvement with UNIX systems, an in-depth knowledge in this area would be a significant advantage.

It is especially desirable that the European Technical Manager will be capable of communicating in languages other than his/her mother tongue, with good ability in English being considered mandatory. The position also demands the level of managerial skills required to develop a knowledgeable and responsive support Organisation, which will gain the respect of all who deal with it.

The position is UK based and all relocation expenses will be paid for the right applicant.

The position is challenging and exciting and applicants who believe that this is the right position for them are invited to forward their CV to **Ian Payne,** Supervising Consultant at the **Birmingham** office, to arrive before Monday 13th September 1982.

Initial interviews will take place in London, Birmingham and Manchester during week commencing 27th September 1982.

Technical, Sales & Management Appointments

SCR

(0782)

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021-236 3761

NORTH
Blackfriars House, The Parsonage,
Manchester M3 2JA
061-833 0427

BELGIUM
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Undoubtedly, the position offers above average career prospects, but initially we would wish to exploit your proven experience gained from sales of mini/microprocessor based turnkey systems to the industrial market.

In order to achieve planned growth, it is essential that opportunities for new business are identified quickly and to this end the successful candidate will be involved at director level in determining future strategy – such involvement indicates the degree of importance placed upon your knowledge of the industrial sector and your ability to assess business potential.

This is an ideal opportunity to join an expanding organisation in a ground floor position which, it is envisaged, will genuinely afford Sales Management responsibility in the short term.

For a completely confidential discussion regarding this significant appointment contact Andrew Carter or Peter Dudgeon on 01 935 0671 (24 hour answering services) or 01 674 8627 (evenings and weekends up to 9pm).

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061-833 0427

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Systems Analysts and Programmers

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ARMCO Data Services

provide an increasing range of D.P. Support for a group of companies in the insurance, banking and leasing fields; Companies committed to a policy of growth and expansion. For A.D.S. staff, this means an increasing opportunity to gain and use new skills and techniques.

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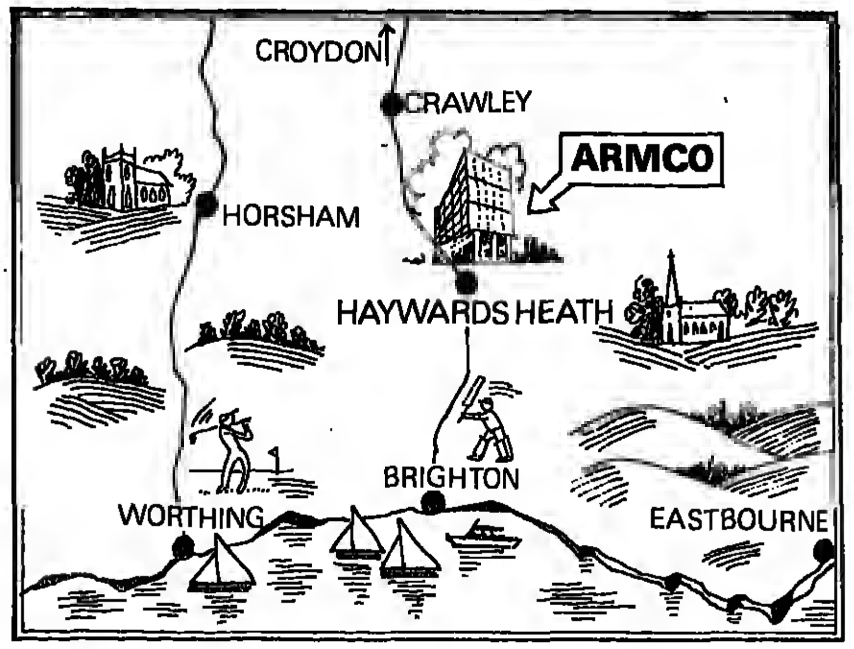
Our central Sussex location offers easy access to the Coast and London, as well as providing a wide variety of housing and recreational facilities.

We are a young installation reflected by the age of our staff and of our operation which has been created from the ground up over the last two years.

At the present time our Paris Company and London office are on-line, using VM/CMS. We anticipate moving towards the use of CICS and database techniques shortly to support the planned growth.

Kit

Currently running an IBM 4341-2 8 megabyte mainframe under OS/VS1 and VM/CMS we plan to progress to a 3083 in 1984/5 under MVS.



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to £13k having developed through a programming background you will by now have gained 2-3 years analysis experience. Ideally having been spent in an insurance or reinsurance environment, could you:

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- Work under pressure in a constantly evolving area?
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- Ideally, provide T.P. design experience.

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- A high level of technical competence in JCL VSAM etc?
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Both positions represent big job opportunities in an expanding company.

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(0734)

Trade Indemnity

OUTSTANDING OPPORTUNITIES IN SYSTEM 38 DEVELOPMENT

Due to continued success in their specialist field, this dynamic, young organisation is expanding and seek a further two individuals with the right qualities to contribute to their future plans.

RPG I/III PROGRAMMER £10,000 + CAR + BONUS

For this position you will need around two years' experience of programming in RPG II and a desire to be involved in both analysis and System 38 development work, sooner rather than later.

ANALYST/PROGRAMMER (CONSULTANT) £12,000 + CAR + BONUS

The successful candidate should currently be either an Analyst or Analyst/Programmer, with experience gained on the IBM GSD hardware. A graduate with a background in financial applications and some experience of programming in RPG II would be ideal.

The company see these positions as providing unlimited potential through a wide range of projects.

Intensive training will be given where necessary. Length of service, whilst not disregarded, is not as vital as the ability to accept and thrive on the high degree of responsibility offered.

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Shell U.K. Exploration and Production

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As part of this role, the process computer engineer will be required to supervise and manage both small and medium sized computer projects and advise users on process computer applications.

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Candidates should be graduate or chartered engineers and should have at least 5 to 10 years' experience in process computer systems, preferably in the petrochemical or related industry. A general background in Instrumentation, Control Engineering or Telemetry is required. Although the position will be based in London, the successful candidate must be prepared to travel and to undertake short assignments offshore or abroad.

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For the successful candidate who meets our requirements, the total remuneration package will be compatible with their expertise and proven ability. In addition, we offer a generous contributory pension scheme and above average fringe benefits. Where appropriate, a high level of relocation assistance will be provided.

Please write for an application form to: Shell U.K. Exploration and Production (UEP/1621), Shell-Mex House, Strand, London WC2R 0DX.

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*B6800 & 6900	Programmer	COBOL
*HP.1000	Programmer	COBOL
*DATA GENERAL	Programmer	AOS, INFOS 2, COBOL

We are also interested in hearing from people with either IMS/COBOL, CICS/COBOL, DL/I, PL/I, MARK IV, or ASSEMBLER.

If you are on contract or are seriously considering taking up contract work, don't delay, forward a C.V. or contact Jackie Robbins today.

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The position will appeal to a top UK salesman who is motivated by high earnings, and the benefits normally associated with a leading company will be provided

Candidates should apply in writing with full c.v. and personal details to the address below

Applications will be forwarded, unopened, to our client unless clearly marked for the attention of the Security Section, enclosing a separate list of companies to which applications should not be forwarded

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THE BRITISH COUNCIL

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Ngee Ann Polytechnic

The British Council and ICL are working with the Government of Singapore to develop this prestigious Centre, which will be equipped with the latest state-of-the-art ICL 2958 mainframe computer. The Centre will have the responsibility to train up to 200 students per year to the approximate level of the BEC/TEC HND Programme in Computer Studies. The Director (designate) of the Centre is Rodney Shaw.

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2. Programming
3. Information Systems

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Candidates should have had several years' experience in the organisation and teaching of computer studies at the level of Higher National Diploma. They should have held a senior post in a relevant British Educational establishment.

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Candidates should be qualified computer professionals with significant experience in the teaching of Computer studies to the level of HND. Candidates who have relevent experience in more than one area of specialisation will have an advantage. A generous package of salary and expatriate benefits will be negotiated with each successful candidate. Posts will begin from December 1982 or June 1983 for two- or three-year appointments.

Interested candidates should phone (01) 580 6572, extension 41, or write to overseas Educational Appointments Department, The British Council, 90-91 Tottenham Court Road, London, W1P 0DT, for detailed particulars of post as soon as possible. Please quote reference 82A 76-82.

THE BRITISH COUNCIL

(0719)

(READVERTISEMENT)

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FINANCE DEPARTMENT

HEAD OF COMPUTER SERVICES

P.O.2(6-10) £12,690-£13,884 p.a.
(Salary Award Pending)

This post is one of four third-tier posts in the Department and is responsible for the management and development of computer systems throughout the Council's services. The vacancy arises from the retirement of the present holder.

Candidates should have several years' successful management experience plus the enthusiasm drive and ability to effect the changeover from ICL 1803T to an ICL 2955 (scheduled for delivery in July 1983) and to develop the potential of the new installation. 100% removal expenses are payable in appropriate cases.

Further details and application forms, returnable by 17th September 1982 available from:– Personnel & Management Services Officer, Chief Executive Officer's Department, Town Hall, Oriel Road, Bootle, Merseyside L20 7AE. Telephone 051-922 4040, extn. 324.

Previous applicants who wish their applications to be reconsidered should confirm this in writing. Canvassing will disqualify.

(0723)

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The Byte Shop chain of microcomputer centres was taken over by the Comart Group in early 1980 and now offers a service in five regions of the U.K. Byte Shop's winning formula is to provide separately for walk-in retail sales of personal computers, media, books and consumables and specialist showrooms for desk-top systems, professional and modular micros. Microserve field service engineers and specialist support personnel back up the efforts of our professional sales team.

The Byte Shop is now looking for further

PROFESSIONAL MICROCOMPUTER SALES EXECUTIVES

to reinforce the sales of professional systems to applications in Industry, business and education. Candidates should have considerable experience of selling computer or office equipment, a functional knowledge of modular computer systems and accomplished skills in one of the computer disciplines. Senior Byte Shop sales executives have strong management skills in time and territory organisation and have excellent promotion prospects.

For further details and application form, please contact June Hamilton, Personnel Office, The Comart Group, Little End Road, Eaton Socon, Cambs. Telephone Huntingdon (0480) 215005.

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Manpower Services is a corporate function of about 40 staff, which includes a fast-growing New Technology development team of project and technical staff. They have been working on the implementation of text processing and electronic mail facilities, using 2 ME29 ICL minis, and a range of local intelligent terminals. The team is also investigating a new telephone system, combining voice and data transfer, plus the application of a range of dedicated micros.

These two posts will join the team, working on personal computing, viewdata systems, and networks. You will be working closely with technical staff, all levels of Council staff, unions and politicians.

Ideally candidates must display some knowledge, skills or potential in applying computer programmes to simple systems and procedures operating in a local authority. A knowledge of one or more programming languages, particularly for personal computing, would be advantageous. Evidence of the personal skills or potential necessary to make software work in a complex and uncertain environment will be vital.

Please contact Simon Turbitt for an informal chat about your experience and the prospects. (01-986-8357).

Application forms available from the Director of Personnel and Secretariat, Town Hall, Mare Street, London, E8 1EA or telephone 01-986 7539 (24 hour answering service) quoting job reference AF727/CW. Closing date: September 16th.

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Bureau, Mini, WP Sales Staff

MOVE INTO FAST GROWING MICRO-COMPUTER SALES

KGB Micros has a reputation as a market leader in Micro-computers. We passed the £1M Sales in March and need motivated professional Sales Staff to continue this growth. If you have sales experience and want to sell a superb range of equipment including the IBM Personal Computer then write to me, Sandy Saunderson, KGB Micros Ltd, 14 Windsor Road, Slough, Berkshire, SL1 2EJ.

KGB MICROS LIMITED

(0750)

JUNIOR COBOL PROGRAMMER

Gerrards Cross c.£6,500

As part of our continued expansion we are shortly due to take delivery of the latest ICL DRS equipment. Currently we are using two 2904's and a network of intelligent terminals.

Our expanding development programme means that we now require an additional programmer – ideally someone in their early/mid 20's with COBOL experience.

As a growing department we can offer real career advancement prospects and the opportunity to become involved in 'Green Field' development work.

For this important position we propose to pay a realistic salary and provide first class terms and conditions of employment including 26 days annual holiday.

For further details and an application form, please contact: G. C. Lean, Personnel Manager, Lovell Construction, Station Road, Gerrards Cross, Bucks. Telephone: Gerrards Cross 82211.

(0771) **Lovell**

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UP TO £10.K PA

Candidates should have a background of applications engineering in computer software development. Knowledge of one or more of the following languages: 'C' FORTRAN, or ASSEMBLER would be advantageous. Candidates should also have a degree or equivalent academic qualification.

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UP TO £9.K PA

Applicants should have experience in digital circuit design, incorporating the use of the latest microprocessor techniques. Previous experience of writing assembler level machine coding would be an advantage.

Candidates should be educated to at least HND level in electronics or a similar subject.

Opportunities for further career development are excellent and the above competitive salaries are accompanied by an attractive package of fringe benefits, including free BUPA and first-rate working conditions.

Please write with a comprehensive C.V. or telephone:
Malcolm Lakin
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Colney Street, St Albans, Herts
Telephone: Radlett 4722

The positions are open to male/female candidates.

INTERNATIONAL GENERAL ELECTRIC COMPANY OF NEW YORK LIMITED

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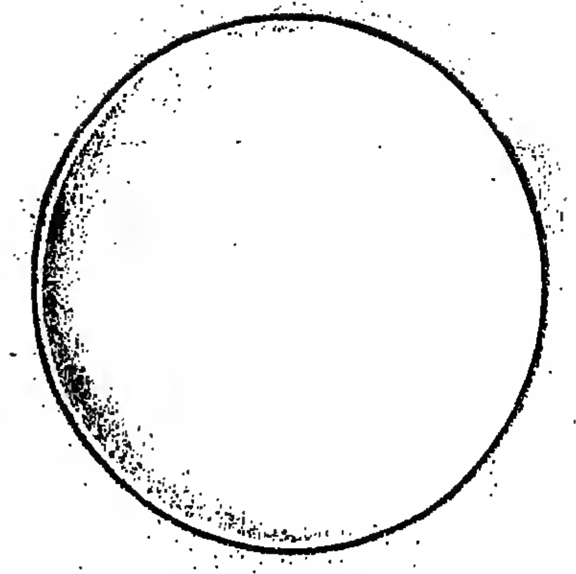

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JOBS IN SCOTLAND

Although demand for trainees is low, some Scottish firms are finding experienced people scarce, says Martin Banks

Recruiting experienced staff a problem North of the Border

AS with many other industries in Scotland, the computer business seems to have settled into the doldrums, with few opportunities for newcomers to get into it – and not that many existing for the experienced, either.

It seems to matter little whether an installation is located in the industrial Lowlands, or out into the Highlands or coastal districts. Neither does it seem to make any difference whether the installation belongs to one of the country's traditional industries, like steel making, or to newer, growth industries like microelectronics. In all areas of activity the answer tends to be the same . . . few if any job opportunities, unless the applicant is prepared to move.

And moving, as far as many people in the existing Scottish computer users fraternity are concerned, means England, and more specifically, the South-East of England where most computer-oriented jobs are felt to exist.

This for example was the view of Alan Richie, operations manager with US-owned semiconductor manufacturer, Motorola. Based in East Kilbride, near Glasgow, Motorola is a company at the leading edge of microelectronics development, and is one of the star names in Scotland's push towards becoming one of the major world centres for this important industry.

"Generally, employment prospects in Scotland are pretty poor," Richie says. "There are very few opportunities. Most of them are down South in England".

This view is supported by David Costine, data processing manager with confectioner R. S. McColl in Glasgow.

"The opportunities in Scotland are few and far between," he says, "especially for trainees. At the moment there is a lack of companies willing to take on trainees."

This once again highlights one of the great dilemmas of industry in general – the classic chicken and egg situation of providing few places for trainees, while at the same time seeking often scarce experienced staff. It is as true of the computer industry as any other, though at present it seems particularly marked in Scotland.

Though there are mailbags full of applications for both existing and non-existent trainee positions at most installations, finding experienced staff can still prove difficult. For example, at Aberdeen District Council, a spokesman said that it was particularly difficult to get senior computer staff such as analysts and programmers to come to the city, despite the oil boom in the area.

The Council had been "for the first time in ages" able to fill some senior positions. Mainly, these had been ex-Aberdonians who had left to get their experience and then been attracted back.

As with Aberdeen, one of the main problems seems to be that the majority of cities and towns in Scotland have few computer installations of any size. Only in Glasgow and Edinburgh is this different. It is therefore difficult to build up a pool of labour with a variety of skills levels.

Several installations within major companies have suffered along with the companies of which they are a part. A notable example is British Steel. At the Ravenscraig steel making plant in Motherwell, where the corporation runs a wide range of mainframe and minicomputer systems, the computer staff have faced redundancies along with most other sections of the company.

According to Stuart Logan, chief systems analyst at the site, there have been no new staff recruited in over three years. If positions in the DP department have needed to be filled, the staff have tended to come either from within (through internal promotions) or through appointing and training staff that have been made redundant from other areas of the corporation.

The state of the Scottish computer insustry in general, he feels, is reflected in the fact that so few staff in such a generally demoralised industry like steel manufacturing have left the corporation. "There are not many opportunities anywhere in Scotland," he said, "unless people are willing to move."

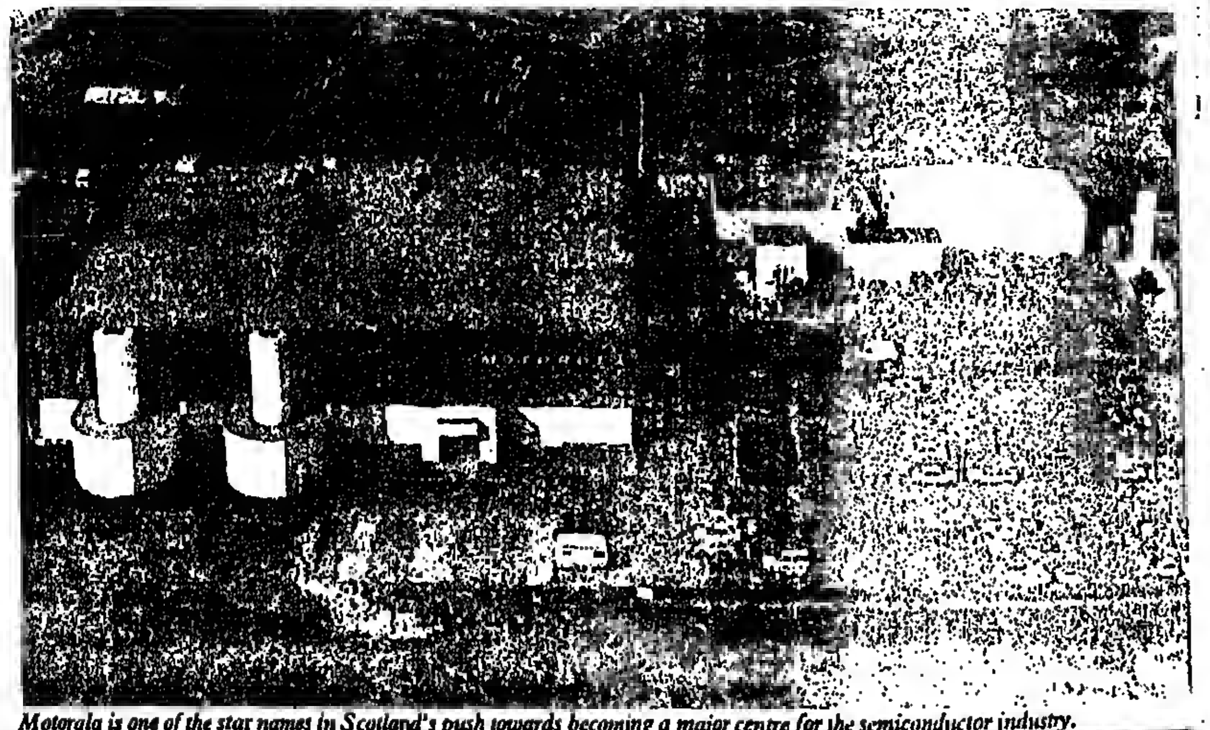
Though it might be expected that a depressed industry like British Steel would suffer in terms of recruitment, those companies that are in other ways doing well are not generally falling over themselves to recruit new staff. At Motorola, for example, ops manager Stuart Richie indicated the company was up to budget on staff levels.

As much of the company's work is remote job entry to the main system in its Phoenix, Arizona headquarters, the majority of the 18 staff are on the operations side, either as operators or key entry staff. On the programming front the numbers are small, and the experience needed considerable.

One of Scotland's major banks, which has asked not to be named, has been recruiting some new staff lately, and according to a spokesman, has had no difficulty at all in finding staff.

The numbers it has sought were low, however, despite its 400-plus staff level. The bank was looking for "raw" trainee operations staff. It operates a policy of training and promoting from within, so trainee programmers are ex-ops staff. Operations is therefore the starting point for nearly all trainees.

At this level, the bank has been looking for qualifications of four or five higher level certificates, with two highers seeming to be the lowest requirement on most installations.



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SYSTEMS ANALYST/DESIGNER

Scottish Provident has a vacancy at its head office in Edinburgh for an experienced Analyst/Designer to take part in the continuing development of computer systems. Applicants should have several years' experience of systems analysis or design. Experience of data communications or database systems would be helpful as would experience in life assurance in the conventional or unit-linked field.

Scottish Provident's main data processing is carried out on a Burroughs mainframe and we also make extensive use of key-to-disk equipment and minicomputers.

The starting salary will depend in qualifications and experience but will probably be in excess of £9,000. The successful applicant will also be eligible for promotion to Senior Analyst/Designer in future.

Non-contributory Pension and Life Assurance Scheme and other attractive fringe benefits including a Staff House Purchase Scheme. Applications should be made in writing to: The Staff Manager, The Scottish Provident Institution, 6 St. Andrew Square, Edinburgh EH2 2YA.

OPPORTUNITY IN TECHNICAL AUTHORSHIP

AMBITIOUS

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PROGRAMMER

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This increased activity has resulted in an additional vacancy for a software Technical Author. The candidate must have a high level language programming background and be capable of communicating the art of software through to the users.

Experience in C language programming would be a definite advantage.

The successful candidate will join the Publications Group to strengthen the existing team of Technical Authors engaged in preparation of users manuals.

The position will appeal to a Programmer or a Software Technical Author who is looking to broaden his experience and join an expanding organisation where success and effort are properly rewarded.

Contact Ross Clark 01-629 7262 (Reverse charges)
or 01-607 4343 (Between 6.30pm 8.00 pm)

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For further details on positions in the **Midlands** and the **North** contact **Clive Wadelin** on **021-236 3781** (24 hour answering service) or 021 449 6125 (evenings).

For the **South** contact **Peter Dudgeon** on **01-935 0671** (24 hour answering service) or 01 674 8627 (evenings).

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021-236 3781

NORTH
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Manchester M3 2JA
061-833 0427

BELGIUM
Avenue Louise 327,
Boite 4, 1050 Bruxelles
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(0763)

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Ian Hume, Manager-Employee Relations,
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FERRANTI ARGUS 700, CORAL 66

Chief Designer
A good track record in Systems Design/Message Switching is required and ideally some team leading experience. FERRANTI ARGUS 700 and CORAL knowledge is desirable but either on its own is acceptable.

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To work on FERRANTI ARGUS 700 Systems using CORAL 66. Exposure to Real Time Computing in the military field would be an advantage. REF JHG.

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For more details please contact Patricia Mole, Personnel Officer, Leasco Software Limited, 150/152 Bath Road, Maidenhead, Berks SL6 4LD. Telephone (0628) 23391. In all cases please quote the appropriate reference.

(0738)

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INTERNATIONAL		
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COBOL, IMS DB/DC, ADF & bonus	Senior Programmer, Programmer/Analysts	London; Home Counties
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For more information please contact:

Resources Department
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(0746)

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Please call: – Roger Perkins, General Manager, on 01-636 4213 or after 8 pm (049481) 3460
or write to: – LBMS Recruitment, 21 Newman Street, London, W1P 3HB.

LICENSED AS AN EMPLOYMENT AGENCY No SE 5387
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L B M S

Database Specialist

£10,000
+ (October review)

Rural Midlands

Our Client is a successful Midlands based commercial Organisation, with a rapidly expanding distributed network of minis and micros based around an 8 Megabyte ICL 2966 Mainframe. Our Client is committed to the extensive use of TOTAL Database on both minis and the mainframe, and as a result, an opportunity has arisen for an experienced person with an in-depth knowledge of Database, ideally TOTAL, to specialise in advising the Company in the optimisation of Database concepts.

Additionally, detailed knowledge of one or more ICL mainframe operating systems would be desirable, as would some experience of related transaction processing and data communications features.

The Database Specialist will enjoy active involvement in User Groups, validating the technical feasibility of new projects and relating current and future capacity to Users needs. Involvement in minis and micros will provide extra challenge and interest.

This is an ideal opportunity for a technically orientated Specialist, seeking technological challenge and freedom of action, within broad guidelines, to drive forward new database development concepts in a Company keen to remain at the forefront of database technology.

Our Client has modern premises set in a pleasant rural area, easily commutable from the major Cities of the West Midlands. Other benefits include staff discounts, a contributory pension scheme with free Life Assurance and full relocation assistance where required.

For further details of this interesting position, contact **Ian Payne** on **021-236 3781** (24 hour answering service) or 0827 282430 (Evenings and Weekends until 9.00 pm).

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(0786)

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061-833 0427

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Avenue Louise 327,
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Burroughs Operators
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This is a marvellous opportunity for operators wishing to expand their skills with a new site. A minimum of two years large Burroughs Systems experience is required. Ref: MM709/CW.

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Ops Support Analyst
Essex £8k+
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Should you have JCL utilities plus MVS knowledge this 4341 installation may interest you. Ref: MM675/CW.

VAX Operators
EC2 circa £6k
A minimum of two years VAX VMS experience is necessary for this banking organisation. Excellent prospects for future promotion. Ref: MM697/CW.

Recruiting for clients.

For all the above requirements contact Madeleine on 01-836 8411.

Unigate

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A challenging position for a Senior Computer Operations person. You need at least 2 years experience of operating Sales Order Processing on a mini computer, preferably a knowledge of programming and the ability to take responsibility for a new datapoint 8602 installation. Are you motivated enough to supervise the running of this new installation? If so, ring Madeleine Menzies on 01-836 8411.

IMMEDIATE CONTRACTS

[illegible]

For details please ring Siobhan on 01-836 8411

CoOperators

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01-836 8411

Customer Support Specialist

MICROSOFT

c£10,000 W. Herts

Microsoft, leaders in microcomputer software, are expanding in Europe.

With such high quality products as Microsoft BASIC, XENIX, MS-DOS and Multitools, Microsoft will require the highest calibre of software Professionals to support its customers in both the 8 bit and 16 bit markets.

Microsoft's customers range from major manufacturers through to dealerships and the Customer Support Specialist will provide a comprehensive support service in these areas, having the ability to listen carefully to customer problems, the technical knowledge to find a solution to the problem and the ability to lucidly explain the solution to the customer.

The position will suit someone in their mid twenties with a good standard of education and above average powers of self expression. Even more important will be a wide knowledge of micros and their associated software, a deep, technical interest in personal computing and the ability to work to the highest professional standards.

In order to maintain an up to date knowledge of the market, the Customer Support Specialist will have access to many makes of micros in addition to being provided with a personal machine to experiment with.

Terms and conditions of employment, which include relocation assistance, are excellent and prospects are superb – for the right person, working for Microsoft means the future is more than secure.

If you think you are good enough for Microsoft, call **Ian Payne** now on **021-236 3781** (24 hour answering service) or at home on 0827 282430 (Evenings and Weekends until 9.00 pm).

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CAREER OPPORTUNITIES IN AN EXPANDING COMPUTER INSTALLATION IN THE MIDDLE EAST

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Minimum 8 years' of Analysis and Programming experience in either Finance/Administration or Engineering applications ideally obtained in IBM DOS Cobol environment and must have Project Management experience. Experience in Interactive System Development tools or structured Analysis and Design Methodologies would be an advantage.

SENIOR ANALYST/PROGRAMMERS

Minimum 6 years' Analysis and Cobol Programming experience of Development of Finance /Administration or Engineering Applications. CICS experience would be an advantage.

For all the above posts minimum requirement is a University Degree or equivalent proficiency in English is essential. A second language (Arabic or French) would be an advantage.

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– Competitive salaries and excellent fringe benefits. No local income tax.

All applications will be dealt with in strict confidence. Interested applicants are invited to submit copies of their curriculum vitae to:

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PO BOX 3212, DOHA – QATAR

(8717)

P.S. APPOINTMENTS LTD. PSA

EDP SYSTEMS ANALYSTS
Saudi Arabia

We are seeking, on behalf of our clients, a number of graduate Systems Analysts to act as Project Leaders for medium size applications and major revisions to existing Data Processing Systems.

Successful applicants will be familiar with various technical programming languages and will have either 3-5 years' experience in EDP or seven years in a directly related field.

Excellent salary and fringe benefits. For further details phone:

PS APPOINTMENTS 01-543 3362
Or write enclosing particulars to:
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They are now looking for three industry professionals to spearhead the launch of the major new product in the UK.

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And will be marketed initially through established Systems/Software consultancies and major end users. Worldwide product support is being established in the UK now and these three executives must have the potential to lead a fast growing team in the near future.

If you are looking for a challenge and a career move call now — Ref. CS.1255.

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STATISTICAL COMPUTER PROGRAMMER

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Applicants should have HNC equivalent in computer science. Salary on scientific officer scale.

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Further details from The Assistant Personnel Officer, NIAB, Huntingdon Road, Cambridge CB3 0LE. Tel: Cambridge (0223) 276381, Ext. 234, quoting Ref. SV/638/CW. Closing date 20th September, 1982.

(0757)

THAMES POLYTECHNIC

SCHOOL OF MATHEMATICS, STATISTICS AND COMPUTING

LECTURER II IN SYSTEMS ANALYSIS AND DATA PROCESSING

Candidates should be graduates, preferably with industrial experience, some knowledge of programming and interests in research and consultancy. The School runs Honours Degree and HND courses in Computing Science and makes a major contribution to Masters Degree, Degree and Diploma courses in the business school.

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This is a temporary full-time appointment, ending in August 1983, to teach computer architecture, programming and operating systems to undergraduates.

Salary scale: £7689-£11658 inclusive.

Further particulars and application form from the Staffing Officer, Thames Polytechnic, Wellington Street, London SE18 6PF, to be returned by 21 September, 1982.

(0722)

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Sorry we can't, at this stage, say who we are, but when we tell you that our Software set-up is one of the largest and most sophisticated in Europe and that if you join us you'll be involved in a fully integrated engineering and software operation, you'll realise that we've got a lot going for us. And for you

There's a lot of variety too. We're working on both civil and military projects and the department provides extensive bureau facilities for staff working on highly advanced real-time, on-line data handling and display systems involving mini and micro-computer application packages, standard software, compilers, operating systems and much more besides.

Our immediate need is for men and women with a degree level education and several years' broad-based software experience to fill the following positions·

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This is, in essence, a consultant's role and will therefore, require a well developed understanding of software implementation and the ability to convey ideas and concepts in a real-time software environment. At least seven years' relevant experience is essential

SOFTWARE ENGINEERS

These positions call for around six years' experience including programming, systems design and implementation gained in a senior role in a mini/micro computer environment. Real-time applications experience would be particularly desirable

SOFTWARE PROGRAMMERS

About four years' relevant experience is called for including Assembler or similar, program specification and design coupled with some formal training in systems design, preferably in a mini/micro environment

All these positions offer highly competitive salaries and a wide range of attractive benefits. Working conditions are first class and we are located in S E England within easy reach of London

Write in the first instance, giving details of experience and stating which position interests you, to Confidential Reply Service, Ref BBE 8192 Austin Knight Limited, London W1A 1DS

Applications are forwarded to the client concerned. Therefore companies in which you are not interested should be listed in a covering letter to the Confidential Reply Supervisor

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Systems Programmers
IBM 3033 8MB, IBM 370/158 4MB

University of Petroleum & Minerals
Dhahran, Saudi Arabia

We have vacancies for experienced Systems Programmers whose main functions will include:

MVS/TSO, VM/CMS operating systems generation and maintenance. CICS on-line interactive software. Program products installation and testing. An ability to train and develop others. IMS "Sysgen" experience would be an advantage.

Applicants should have had five years' DP experience with IBM equipment and will preferably have worked in an MVS or VM environment. They should be familiar with PL/1 and IBM ASSEMBLER. Ideally they should have a degree or equivalent.

Experience of a higher educational environment would be an advantage.

Benefits:

University offers minimum regular contract for two years, renewable. Salaries are competitive. Free air transportation to and from Dhahran each year. Housing and local transportation allowances. All earned income without Saudi taxes.

Apply urgently with complete resume on academic, professional, personal data, list of references and with copies of degrees/certificates, including home and offices addresses and telephone numbers to:

Dean of Faculty & Personnel Affairs, University of Petroleum & Minerals,
P.O. Box 144, Dhahran International Airport, Dhahran, Saudi Arabia.

LONDON BOROUGH OF EALING

EDUCATION SERVICE

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APPLICATIONS PROGRAMMER

Salary (AP4 Scale):
£7,032-7,869 per annum inclusive

required to work on a Prime 550 system supporting up to 64 simultaneous users.

The work involved, i.e. extremely varied and will include applications on microcomputers. Applicants should, preferably, have a degree or equivalent and be fluent in at least two programming languages.

Further details and application form from The Chief Administrative Officer (TD/uc), Ealing College of Higher Education, St Mary's Road, London, W5 5RF. Telephone number 01-579 4111. Out-of-hours answerphone service available on 01-840 1995.

Closing date: September 18, 1982. Please quote Ref. ED 666.

(0762)

Available for direct contract

ANALYST/PROGRAMMER

10 years' computing experience, plus degree. References and guarantee available.

Telephone (0283) 467549 for c.v. and details

(NO AGENCIES PLEASE)

(0700)

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Details (send s.a.e.) from the:
Principal
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(0618)

CITY OF LONDON POLYTECHNIC

HEAD OF COMPUTER SERVICES

Salary: £16,422 p.a. to £18,048 p.a.
including London Weighting

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Conditions of service include contributory pension scheme, and 28 days' annual leave.

Salary is on a scale £15,513 p.a. to £17,139 p.a. including London Weighting plus an additional allowance of £909 p.a.

For further details and an application form please write, on a postcard, to the Staff Records Officer, City of London Polytechnic, 117 Houndsditch, London EC3A 7BU quoting reference number 82/75.

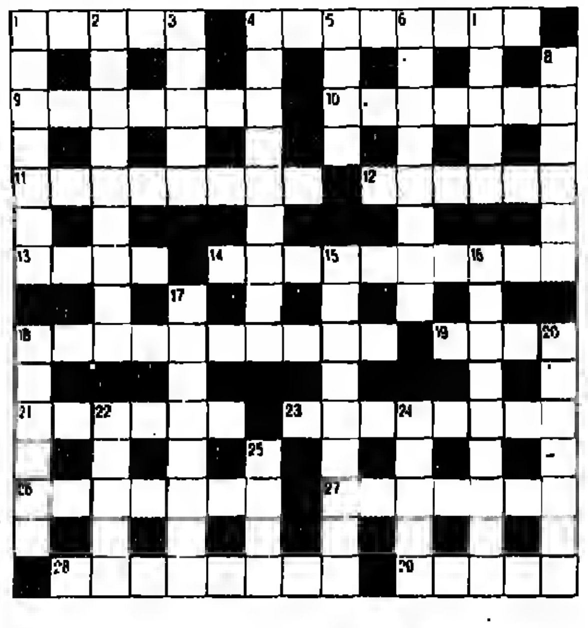
(0721)

CROSSWORD

Prize Crossword No 32

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS, by first post Friday, September 10. Please use a ballpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name .... (Miss, Mrs, Ms, Mr)

Address ....

....

Telephone ....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed .... Date ....

ACROSS

1\. What scoundrel turned over the lace frill? (5)
4\. Carriage lights will improve one's view (3-5)
9,10\. Extremely anxious, like a fox caught by hounds? (7,2,5)
11\. By way of illustration, ring a chap, one with a morbid self-conceit (8)
12\. People who con prudes disgracefully (6)
13\. Witnessed a dramatic incident, we hear (4)
14\. One who disposes of papers, breaking down with nerves (4-6)
18\. University status that causes friendliness (10)
19\. Rebuff for warship appearing around the North (4)
21\. Tomb with name on, carved by sculptor (6)
23\. See me repeatedly eating refuse for a film (8)
26,27 Where a very naughty pupil is taken, getting a staggering blow? (5,2,3,4)
28\. Torch refills made in uninteresting little rooms (3-5)
29\. After parties, 'e'd given measured portions of medicine (5)

DOWN

1\. Hostility springing up over head's lack of experience (7)
2\. NCO sent round the East for material (9)
3\. Heather is a girl's name (5)
4\. Has meal in digs, unusually, being light-headed (9)
5\. Label put up on eastern entrance (4)
7,6\. Queen paid a tec extravagantly for undisturbed tranquility (5,3,5)
8\. A cooling drink for a Grand National horse? (6)
15\. A good man, and is holding permit to make daggers (9)
16\. Overalls, smashing gear when in sand-hills (9)
17\. Concerned with the house, the head's having a muscular convulsion (8)
18\. An amount you've to imagine (6)
20\. Car-makers finished, all mixed up (7)
22\. Risk losing head with passion (5)
24,25\. Start to brag about a funny little loaf (5,4)

RULES AND CONDITIONS

1\. Each competitor may submit no more than one entry.

2\. The competition is open to all readers of Computer Weekly with the exception of the staff of IPC Business Press Ltd, any printers employed by them or the near relatives of any such staff.

3\. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.

4\. Winners will receive their prizes during the month following the competition.

5\. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

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(0780)

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(0779)

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Details from Assistant Personnel Officer, Coventry (Lanchester) Polytechnic, Priory Street, Coventry CV1 5FB (enclose a large self-addressed envelope). Closing date Monday, 20th September, 1982.

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Application form and further details from: The Bursar, Netherhall School, Queen Edith's Way, Cambridge.

(0772)

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Applications are invited for a lectureship in Computer Science within the Department of Mathematics to commence on 1st January, 1983, or as soon as possible thereafter. Further particulars may be obtained from the Registrar, Senate House, Tyndall Avenue, Bristol BS8 1TH, to whom applications should be sent by 17th September, 1982 (please quote reference E.B.).

(0569)

County Treasurers

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Application forms obtainable from The Personnel Officer, County Hall, Bedford (see please).

Closing date September 22, 1982.

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(0774)

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Contact: Don Burridge.

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(0783)

Analyst/Programmer

A vacancy exists in the Rutherford Appleton Laboratory Computing Division Database Section for an Analyst/Programmer specialising in Databases. The work involves:

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(b) Design and Specification of Systems
(c) Programming
(d) Implementation of Systems
(e) User Support.

Applicants should have a good honours degree in Computer Science or related subject.

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Closing date for applications 23rd September, 1982.

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TEMPORARY SENIOR PROGRAMMER/STATISTICAL ADVISER

Applications are invited for a temporary post of Senior Programmer/Statistical Adviser for one year, starting on October 1, 1982, or as soon as possible thereafter in the Research Support Unit of the Arts and Social Studies Area.

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Further particulars and application form, returnable by September 21, 1982, available from the Personnel Office, Sussex House, University of Sussex, Brighton, BN1 9RH (Brighton 606755, Mrs. Stephey), quoting reference 481/2.

(0778)

PUZZLE ANSWER

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